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SUGGESTED GUIDE FOR THE USE OF INSECTICIDES TO CONTROL INSECTS AFFECTING CROPS, LIVESTOCK, HOUSEHOLDS, STORED PRODUCTS, AND FOREST PRODUCTS

1966

Agricultural Research Service and Forest Service
U.S. DEPARTMENT OF AGRICULTURE

U.S.D.A. POLICY ON PESTICIDES

One of the most important responsibilities of the Department of Agriculture is to develop and facilitate the use of methods and materials for the control of pests. The Department's research, education and regulatory programs are expected to make continuing progress in the never-ending struggle to protect man, his food and fiber supplies, and his forests from the ravages of pests. Such protection is essential if the American people are to continue to enjoy their present high standard of living, and if this abundance of quality food and relative freedom from the hazards of pests is to be enjoyed by all mankind.

In protecting man, animals, plants, farm and forest products, communities and households against depredation of pests, the Department has vital concern for (1) the health and well-being of people who use pesticides and those who use products protected by their use; and (2) for the protection of fish, wildlife, soil, air and water from pesticide pollution.

In keeping with this concern, it is the policy of the Department of Agriculture to practice and to encourage the use of those means of effective pest control which provide the least potential hazard to man and animals. When residual pesticides must be used to control or eliminate pests, they shall be used in minimal effective amounts, applied precisely to the infested area and at minimal effective frequency. Biological, ecological or cultural methods or non-persistent and low toxicity pesticides will be used whenever such means are feasible and will safely and effectively control or eliminate target pests.

In carrying out these objectives, the Department will cooperate in the fullest with the other agencies and departments of Government, and will seek to develop broad areas of collaboration in establishing the criteria to guide the use and development of pest control materials.

Further, the USDA will urge that all users of pesticides exercise constant vigilance to assure the protection of human health by avoiding unnecessary exposure of crops, livestock, fish and wildlife.

The Department commends this policy to states and local authorities as a guide in their respective jurisdictions.

Orville L. Freeman

Secretary's Memorandum 1565,
issued December 23, 1964.

SUGGESTED GUIDE FOR THE USE OF INSECTICIDES TO CONTROL INSECTS AFFECTING CROPS, LIVESTOCK, HOUSEHOLDS, STORED PRODUCTS, AND FOREST PRODUCTS—1966

PREFACE

This Handbook is intended to be a guide for entomologists and other research and extension workers rather than to provide information for individual users of insecticides. It was prepared by the Entomology Research and the Market Quality Research Divisions, Agricultural Research Service, and the Divisions of Forest Pest Control and Forest Protection Research, Forest Service, as of January 1, 1966.

This guide suggests uses of chemicals for the control of insects and related pests that affect crops, livestock, households, forest products, and agricultural products in storage. The information was compiled in consultation with the Pesticides Regulation Division of Agricultural Research Service, the Federal Extension Service, and the Cooperative State Research Service. It is emphasized that these insecticide uses are those suggested by the U. S. Department of Agriculture. However, they are based on information obtained by various Federal, State, and other research organizations.

This Handbook is intended to supplement information and recommendations issued by State agencies. The chemical uses it suggests do not necessarily apply to all areas or parts of the country. There are other suggestions and other materials registered for use that will meet the requirements of the Federal Insecticide, Fungicide, and Rodenticide Act and the provisions of the Pesticide Residue Amendment of 1954 and the Food Additives Amendment of 1958 to the Federal Food, Drug, and Cosmetic Act.

Tolerances for some insecticides have not yet been established by the Food and Drug Administration, and previously established tolerances are occasionally reconsidered and modified. As new tolerances are established or changes made, the Department will review these suggested uses and modify them as needed to insure that residues do not exceed the new tolerances. Since new materials and new uses for older materials are registered throughout the year, we suggest that you keep in touch with your State agricultural experiment station, State extension service, the Department of Agriculture, or manufacturers of specific products, for up-to-date information.

Many of the suggested uses in this Handbook appear in other publications of the Department. The important publications are listed. However, some of the earlier recommendations have been modified and others are new and have not previously appeared in print. The chemical uses suggested in this Handbook take priority over those in other publications of the Department published before February 1, 1966.

This Agriculture Handbook supersedes Agriculture Handbook 290, "Suggested Guide for the Use of Insecticides to Control Insects Affecting Crops, Livestock, and Households—1965"

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OTHER MEANS OF INSECT CONTROL

In addition to the use of insecticides, there are a number of other ways to control or to help control insect pests. Natural control factors, such as insect parasites, predators, and diseases, and adverse weather conditions are continually at work in the field. In many instances, they reduce and keep pest populations at noneconomic levels. Good sanitation and housekeeping practices are essential for effective control of house flies, stable flies, cockroaches, fleas, and similar pests, even when supplemented by the use of chemicals. Cultural and mechanical practices aid materially in the control of certain crop pests, including the pink bollworm, boll weevil, and tobacco hornworm. Crop varieties resistant to insect pests have been developed and are available to avoid or reduce damage by such insects as the Hessian fly, wheat stem sawfly, spotted alfalfa aphid, and European corn borer.

Subjecting harvested products to heat or extreme cold in storage often destroys or inhibits the development of insect infestations. Insect-free commodities can be protected by insect-resistant packaging and sanitation in storage and in marketing channels.

More satisfactory control of insect pests may frequently be obtained by carefully integrating the use of insecticides or fumigants with the beneficial effects of biological control agents or other nonchemical measures. It may be necessary to use insecticides only as a supplement to other control methods.

In the case of any insect infestation, all means of control must be considered, in order to capitalize on the value of all control factors and coordinate these factors to the greatest advantage, with the least harmful effect to the environment and to living organisms within it. Various State and Federal publications suggest this approach to pest control. Consult these publications and your State agricultural experiment station for the latest information. Do not use insecticides or fumigants unless they are needed.

IMPORTANT CONSIDERATIONS IN THE APPLICATION OF INSECTICIDES

The key to effective use of insecticides without injury to the treated plants or animals is to follow directions on the label and not use any insecticide preparation for any use for which it is not specified. Most oil sprays prepared for use on walls of buildings will injure living plants or animals. Insecticide concentrates prepared for use on plants may injure or kill treated animals and result in illegal residues in animal tissues or byproducts.

Only general information can be given here on the effective application of insecticides, since much depends on the habits of the insect pest, the kind of damage that it causes, the nature and condition of the infested plants, animals, or commodities, the particular insecticide and formulation used, weather conditions, and the application equipment. For information to meet special needs, consult your State agricultural experiment station.

Weather Conditions

Wind, rain, and sun play an important part in the control you get from outdoor use of insecticides. Keep an eye on the weather. Local weather reports may be of help in planning insecticide applications. Before you start to treat, watch the tops of trees or use other means of determining the direction and amount of wind. Generally speaking, avoid application of insecticides when the wind is blowing faster than 8 miles an hour. Some air movement is helpful. High and shifting winds, however, can cause an insecticide dust or spray to be unevenly distributed on the plants and to drift away from target areas.

Usually the best time for airplane spraying is in the early morning or late evening. Treating at these times minimizes the harm to bees and other pollinating insects.

If rain is predicted, it is best to postpone treatment, if possible. Rain falling soon after you treat may reduce the effectiveness of an insecticide deposit. Cold weather may have the same effect. Some insecticides must be applied at temperatures above 50° F. to be of value.

Extremes in weather during or following the spraying of fruit trees may lead to fruit or foliage injury. Injury such as russeting of fruit may be increased by pecticide sprays if they are applied at night or during cool, rainy or humid weather. Emulsifiable materials are more likely to cause injury than wettable powders.

Condition of Host Plant or Animal

The type and density of plant foliage, as well as the extent of coverage needed, may influence the choice of formulation that is applied. In some instances a coarse spray will be the most effective; in others, a fine spray, mist, or fog will give better pest control. Plants with smooth leaves are apt to have a quicker runoff of spray material than those with rough surfaces. However, stickers that are included in the formulation, or that may be added, help the material adhere to the plants.

Sick, emaciated, or stressed animals may react unfavorably to some treatments that normally are harmless. Thick hair on livestock may keep the insecticide from penetrating. Consider all such circumstances in selecting an insecticide, type of formulation, or type of equipment that will provide the best and safest control of the target pest.

Diluting and Mixing Sprays

Most spray materials are formulated with enough wetting and sticking agents to correct for water hardness and to improve their other physical properties.

Materials may be purchased to add to the tank mix to improve spraying properties. However, improper use of an adjuvant can cause plant injury or reduce control through excessive runoff. An excessive amount of adjuvant may result when several pesticides are added to the same tank. Several pesticides that do not injure plants when applied alone may cause injury when mixed with other materials. Certain mixtures will result in a breakdown of one or more of the chemicals.

Before mixing two or more pesticides or adding wetting or sticking agents, read the labels and consult the manufacturer, a spray compatibility chart, or a spray bulletin regarding possible injury to plants.

Calibration of Equipment for Applying Insecticides [1]

At the start of each growing season, thoroughly inspect and calibrate all equipment you will use to apply insecticides to crops. Repeat thereafter whenever you use a different rate of application. It is most essential that you apply the correct dosage, not only to obtain effective control of the insect pest but also to avoid plant injury and to be certain that any residue remaining at the time of harvest or feeding does not exceed the tolerance established for that particular chemical on the crop you treat.

Power Sprayers.—Before you start to spray, check or calibrate the sprayer to determine whether it will deliver at the desired rate. *Note:* Since viscosity of spray material can affect the discharge rate, it is preferable to calibrate the sprayer with the mixture you plan to use. It is also preferable to make your calibration in an area as similar as possible to the one you plan to treat.

One method of calibrating a sprayer for field use is as follows: (1) Set two stakes in the ground 40 rods apart (660 feet). (2) With the sprayer on level ground, fill the tank with the liquid. Then operate the sprayer long enough that all nozzles are discharging smoothly. Cut off sprayer and refill tank. Then mark the height of the spray material on a measuring stick that you have calibrated in gallons for your particular tank. (3) Drive the spray rig one round trip between stakes at the speed and pressure suggested by the nozzle manufacturer, with the sprayer in full operation. *Spray only between the stakes.* (4) With the sprayer again on level ground, place the measuring stick in the tank and determine the gallons of spray used for the round trip. (5) Multiply the number of gallons used by 33 and divide by the number of feet of width sprayed. The result of this calculation will be the number of gallons required per acre.

EXAMPLE.—Suppose the boom on your sprayer is 20 feet long, and it took 5 gallons of spray material to refill the tank after spraying the round trip during the calibration. Five times 33 divided by 20 equals 8.2 gallons per acre.

If the calibration shows that the application rate is too low, increase the rate by reducing the speed of travel or increasing the pressure. You may decrease the rate by doing the opposite in each case.

Power Dusters.—Before starting a dusting operation, check the application rate of the duster unit. Dust mixtures vary in density, and

[1] Information furnished by the Agricultural Engineering Research Division, Agricultural Research Service.

the application rate can vary at a given setting of the feed regulator.

A procedure that can be used to calibrate a duster is as follows: (1) Measure off an area of at least one-half acre (21,780 square feet). (2) Fill the dust hopper and set the feed regulator for the desired application rate. (3) Dust the measured area. Drive at a constant speed, because rate of speed affects the application rate. Use of a tractor speedometer is recommended. (4) Refill the hopper from a weighed amount of dust. Subtract the weight of the dust left over from the weight of the original amount. This gives the amount required to fill the hopper and, therefore, the amount applied to the measured half acre.

Applicators for Granules.—Many equipment manufacturers and some producers of granular insecticides can provide tables showing the proper settings of the feed mechanism for selected flow rates of specific materials. It is usually necessary, however, to calibrate the applicator for each new batch used because of the allowable range of sizes in a formulation and because of differences in density.

You may find it convenient to affix paper bags at the dispersing points of the applicator, run a measured course at a measured speed, and then weigh the granules collected. Calculations can then be made to show how many pounds of granules are being dispersed per acre.

Or you may calibrate your applicator in the field. Set the applicator to distribute less than the manufacturer recommends. Then measure out 1 pound of granules at a time and mark the level in 1-pound increments on the inside of each hopper. The marks tell you how fast the granules feed down, and the applicator can then be gradually opened up to get the rate desired.

Aircraft Equipment.—For information on aircraft calibration, consult U.S.D.A. Agriculture Handbook No. 287, "Aerial Application of Agricultural Chemicals."

GENERAL PRECAUTIONS FOR SAFE USE OF INSECTICIDES

The following safeguards are for the protection of the ultimate consumer of food crops and animal products and of honey bees, other pollinating insects, fish, and wildlife, as well as of handlers of insecticides and treated plants.

Insecticides improperly used may cause injury to man and animals. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the container label. Do not exceed the maximum dosage suggested. Always apply the least amount of an insecticide required. Insecticides should be kept in closed, well-labeled containers, in a dry place where they will not contaminate food or feed, and where children and animals cannot reach them.

Protection of Person Using Insecticides

In handling any insecticide, avoid repeated or prolonged contact with skin and prolonged inhalation of dusts, mists, and vapors. Wear clean, dry clothing and wash hands and face before eating or smoking. Launder clothing daily.

The handling and application of most concentrates and the handling and application of oil solutions applied as coarse sprays require special precautions. When handling or mixing a concentrate of any insecticide, avoid spilling it on the skin and keep it out of the eyes, nose, and mouth. If any is spilled, wash it off the skin and change clothing immediately. Launder clothing thoroughly before wearing it again. If the concentrate gets in the eyes, flush with plenty of water for 15 minutes and get medical attention.

The following insecticides can be used without special protective clothing or devices, provided they are in dusts, water sprays, oil mist sprays, granules, or baits that have been diluted to the strengths suggested in this handbook. Concentrates of these insecticides should be handled in accordance with the precautions for such materials as described above. In all cases follow the label precautions.

allethrin
Aramite
Bacillus thuringiensis
calcium arsenate
carbaryl (Sevin)
chlorobenzilate
cryolite
DDT
dicofol (Kelthane)
Dilan
fenson
Genite 923
Kepone
lead arsenate

Lethane 384
lime sulfur
malathion
metaldehyde
methoxychlor
mirex
Morestan
naphthalene
orthodichlorobenzene
ovex
paradichlorobenzene
paris green
Perthane
piperonyl butoxide
pyrethrins
pyrethrum
ronnel
rotenone
ryania
sabadilla
Strobane
sulfur
Sulphenone
TDE
tetradifon (Tedion)
Thanite
trichlorfon

The following insecticides can be absorbed directly through the skin in harmful quantities. When working with these insecticides in any form, take the same precautions as with concentrates.

Abate
aldrin
benzene hexachloride
binapacryl
chlordane
Ciodrin
coumaphos (Co-Ral)
diazinon
dichlorvos (DDVP)
dieldrin
dimethoate
dinitrobutylphenol
dinitrocresol
dinitrocyclohexylphenol
dioxathion (Delnav)
endosulfan (Thiodan)
ethion
fenthion (Baytex)
heptachlor
lindane
naled (Dibrom)
Nemacide (V-C 13)
Ruelene
toxaphene
Zectran

The following chemicals are extremely poisonous and may be fatal if swallowed, inhaled, or absorbed through the skin. These highly toxic materials should be applied only by a person who is thoroughly familiar with their hazards and who will assume full responsibility for proper use and comply with all the precautions on the labels.

azinphosmethyl (Guthion)
Bidrin
carbophenothion (Trithion)
Compound 4072
demeton
dichloropropane-dichloropropene mixture
disulfoton (Di-Syston)
DN-111
endrin
EPN
methyl parathion
Methyl Trithion
mevinphos (Phosdrin)
nicotine sulfate
parathion
phorate
phosphamidon
Telone
tepp

The following insecticides are used in closed spaces as fumigants and, because of their volatility, are considered to be hazardous by inhalation. Fumigation in closed spaces should be done only by a licensed pest control operator or by a qualified individual who is thoroughly familiar with their hazards, who will assume full responsibility for their proper use, and who knows he must comply with all precautions on the labels. The value given in parentheses after each material is the maximum average atmospheric concentration of the insecticide by volume, to which workers might be exposed for an 8-hour day without injury to health. These threshold limit values were adopted at the 26th Annual Meeting of the American Conference of Governmental Industrial Hygienists, April 1964.

acrylonitrile (20 p.p.m.)
aluminum phosphide (as phosphine 0.3 p.p.m.)
calcium cyanide (40 mg. dust/cu.m.)[2]
carbon disulfide (20 p.p.m.)
carbon tetrachloride (10 p.p.m.)
chloroform (50 p.p.m.)
chloropicrin (0.1 p.p.m.)
ethyl formate (100 p.p.m.)
ethylene dibromide (25 p.p.m.)
ethylene dichloride (50 p.p.m.)
ethylene oxide (50 p.p.m.)
hydrogen cyanide (10 p.p.m.)
methyl bromide (20 p.p.m.)
methyl formate (100 p.p.m.)
propylene dichloride (75 p.p.m.)
propylene oxide (100 p.p.m.)
tetrachloroethylene (100 p.p.m.)
trichloroethylene (100 p.p.m.)

Reduce the danger of skin exposure to insecticides by wearing protective clothing and equipment as specified on the container label. If called for, wear a respirator or mask of a type that has been tested by the U.S. Department of Agriculture and found to be satisfactory for protection against the particular insecticide being used. Full-face masks are needed under certain conditions. They should

[2] Not from list of threshold limit values.

always be worn by persons applying fumigants in buildings or warehouses. They should also be worn by persons applying the type of insecticide aerosols used in commercial greenhouses and warehouses. In many cases masks are needed by persons loading insecticides into aircraft or applying them by aircraft. A current list of acceptable respiratory protective devices for protection against certain pesticides may be obtained from the Entomology Research Division, Agricultural Research Service, Beltsville, Md. 20705.

The gas methyl chloride, used as a propellant in greenhouse aerosols, and the liquid fumigants carbon disulfide, ethyl formate, ethylene oxide, methyl formate, propylene dichloride, and propylene oxide are flammable and explosive. Never use them near heat or fire in any form. Never open containers of these chemicals where there is little air in circulation without wearing an adequate full-face mask. Do not transfer ethylene dibromide or any liquid fumigant from one container to another in a closed room; do not breathe the fumes.

Protection of Persons Handling Treated Plants

If you must transplant or otherwise handle plants within 5 days after treatment with azinphosmethyl, endrin, demeton, disulfoton, or parathion, or within 1 day after treatment with methyl parathion or mevinphos, protect your skin by wearing clean, dry cotton gloves. If gloves become wet, replace them with clean dry ones. If you must work in close contact with treated crops, as in thinning or harvesting, you should also wear dry, clean, tightly woven clothing.

Treatment for Poisoning

It is important to call a physician and give first aid immediately. If breathing has stopped, give artificial respiration. If two persons are present, one should give first aid while the other obtains the insecticide label and calls the physician. Tell him the name of the insecticide and obtain instructions.

If a person swallows insecticide, have him drink large amounts of water. Also he should be made to vomit, unless insecticide formulation contained oil. Do not induce vomiting if the insecticide formulation contained either kerosene-type petroleum oil or any thick oily solvent. Induce vomiting if the insecticide contained xylene as a solvent. However, always induce vomiting if the victim has swallowed a potent amount of highly toxic material and a physician will not be available within 30 minutes. A tablespoonful of salt or baking soda in a glass of warm water will help induce vomiting. Have the victim lie down and keep quiet until you get advice from the physician. Keep the patient warm.

If a concentrate or oil solution is spilled on the skin or clothing, remove contaminated clothing, and wash skin with soap and water. If a person feels sick while using an insecticide or shortly afterwards, call a physician immediately. In all cases make available the pesticide container and any attached labeling. Information provided by them is extremely valuable to the physician. Inform him of all recent contacts with insecticides; the one most obvious to you may not be the one to blame.

If a person is overcome by the vapor of a fumigant, prompt, on-the-spot action is essential. Carry the patient outdoors or to a room free of gas and have him lie down. Remove contaminated clothing and keep him warm. Administer first aid treatment immediately. If breathing has stopped, give artificial respiration. Call a physician immediately. Fumigators should have kits properly equipped with antidotes required for first aid treatment of a victim of the specific fumigant being used and instructions on treatments that are to be administered only by a physician.

In many cities there is a Poison Control Center that will have available information concerning symptoms and treatment of cases of actual or suspected poisoning by pesticides; consult your local telephone directory. If you cannot obtain this information locally, call the U.S. Public Health Service at Atlanta, Ga., telephone 404–634–5131, or Wenatchee, Wash., telephone 206–662–5506. For a list of poison control centers see Public Health Service Publication No. 1278, "Directory Poison Control Centers" (February 1965).

Protection of Fish and Wildlife

Whenever possible, select insecticides and methods of application that are least hazardous to fish and wildlife, especially if insect control is necessary in important wildlife habitats such as aquatic areas, forests, and range. Avoid drift of insecticides as much as possible and limit applications of insecticide to the target area. To prevent damage to fish, fish-eating birds, and other aquatic animals,

be careful not to contaminate streams, lakes, marshes, or ponds by improper application, or through excessive drift, of insecticides. Where drift is difficult to control, sprays are recommended instead of dusts, and ground applications instead of air applications. In some cases where critical areas such as streams and lake margins must be treated, it may be possible to choose the insecticide that is least harmful to fish and wildlife for special treatment. Do not clean spraying equipment or dump excess spray materials in or near streams or other water areas where drainage could contaminate the water.

Protection of Insect Parasites and Predators

A grower's program of crop pest control should be designed to take maximum advantage of any biological control factors that may be present. Whenever possible, the insecticide should be selective against the pest species concerned, and of minimum danger to beneficial insects. If parasites or predators are abundant, it may be advantageous to defer or omit insecticide treatments.

Protection of Honey Bees and Other Insect Pollinators

Many insecticides are hazardous to honey bees and to other pollinating insects. Damage to bees can be minimized by taking the following precautions:

- Use the material least toxic to bees that will control the insect pest.
- If a highly toxic material must be used, apply it during hours when the bees are not visiting the plants. Treatment during the night or early morning is the safest.
- Use sprays instead of dusts. They are usually less hazardous. Application with ground equipment is less hazardous to bees than airplane application.
- Avoid drift of insecticide into bee yards and adjacent crop or wild plants in bloom.
- Use the lowest effective dosage and make a minimum number of applications.
- Notify beekeepers at least 48 hours before dusting or spraying large acreages so that measures can be taken to protect the bees.

The following groupings indicate the relative toxicities of many of the insecticides to honey bees, as determined by laboratory and field tests.[3] For further information applicable to local conditions, consult your State agricultural experiment station.

Highly toxic.—These materials will cause severe losses if used when bees are present at time of treatment or within a few days afterwards:

aldrin
azinphosmethyl (Guthion)
benzene hexachloride
Bidrin
calcium arsenate
carbaryl
chlordane
Ciodrin
diazinon
dichlorvos (DDVP)
dieldrin
dimethoate
EPN
fenthion (Baytex)
heptachlor
lead arsenate
lindane
malathion
methyl parathion
Methyl Trithion
mevinphos (Phosdrin)
naled (Dibrom)
parathion
phosphamidon
sabadilla
tepp
Zectran

Moderately toxic.—These materials can be used with ordinary precautions but should not be applied directly on bees in the field or on the colonies:

carbophenothion (Trithion)
chlorobenzilate
coumaphos (Co-Ral)
DDT
disulfoton (Di-Syston)
endosulfan (Thiodan)
endrin
fenson
mirex
Perthane
phorate
ronnel
TDE

[3] "Toxicity of Pesticides to Honeybees." University of California Agricultural Extension Service and United States Department of Agriculture cooperating. One Sheet Answer 170 Rev. (1964).

Relatively nontoxic.—These materials can be used with a minimum of injury to the bees:

allethrin
Aramite
Bacillus thuringiensis
binapacryl
cryolite
demeton
dicofol (Kelthane)
Dilan
dioxathion (Delnav)
ethion
Genite 923
methoxychlor
Morestan
nicotine sulfate
ovex
pyrethrins
rotenone
ryania
Strobane
sulfur
tetradifon (Tedion)
toxaphene
trichlorfon

Avoiding Harmful Residues on or in Food and Feed

Residues in excess of the established legal tolerances can be avoided by applying only those insecticides specified for use on the crop or livestock and by following indicated schedules. Do not exceed recommended dosages. Observe carefully the safety restrictions, especially the required interval between the last application and harvest or feeding and between the last application and slaughter of animals.

Avoid drift of insecticide sprays or dusts to nearby crops or livestock, especially from applications by airplane and other power equipment. Do not allow poultry, dairy animals, or meat animals to feed on plants or drink water contaminated by drift of insecticides.

Sugarbeets are susceptible to contamination with residues of chlorinated hydrocarbons such as aldrin and dieldrin in the soil. Whenever practical avoid the use of these materials on the foliage of crops grown in rotation with sugarbeets. Do not use aldrin, dieldrin, heptachlor, chlordane, DDT, or toxaphene in soils where the crop rotation includes sugarbeets.

Byproducts from a number of crops treated with insecticides may be safely fed to livestock or poultry if the crops are harvested or fed after the specified waiting period. However, when byproducts from some crops treated with certain insecticides are fed to livestock, insecticide residues may appear in meat, milk, or eggs in excess of established tolerances. Before use, read carefully the safety restrictions in the last column of the tables beginning on page 1 of this Handbook to determine if such byproducts as sweet corn husks, citrus pulp, bagasse, alfalfa threshings, apple pomace, bean and pea vines, sugarbeet tops, cull potatoes, trimmings from leafy vegetables, and gin waste from cotton are safe for feeding to dairy animals, poultry, or animals being finished for slaughter.

Safe Disposal of Empty Insecticide Containers and Surplus Insecticides

The careful disposal of empty insecticide containers and surplus insecticides is an important part of safe insecticide use. When possible, growers should carry their empty insecticide containers to a sanitary land-fill type dump. If a suitable dump is not available, burn empty insecticide bags and cardboard containers in the open and bury the ashes in an isolated place where they will not contaminate water supplies. *Keep out of the smoke.* Break or crush glass and metal containers (except pressurized cans) and bury in an isolated place where they will not contaminate water supplies. Pour excess insecticides into a hole dug in level ground in an isolated place where they will not contaminate water supplies, and cover with dirt to a depth of at least 18 inches. If you have trash collection service, wrap empty insecticide containers in heavy layers of newspapers before placing them in trash cans.

For more specific information on the safe use of insecticides, consult your State agricultural experiment station or one of the following U. S. Department of Agriculture publications:

Farmers' Checklist for Pesticide Safety (Program Aid No. 622)

Safe Use of Pesticides in the Home—in the Garden (Program Aid No. 589)

Apply Pesticides Safely by Aircraft (Unnumbered)

Safe Disposal of Empty Pesticide Containers and Surplus Pesticides (Unnumbered)

Behind the Pesticide Label (Picture Story No. 168)

Respiratory Devices for Protection Against Certain Insecticides (ARS–33–76–2)

Aerial Applications of Agricultural Chemicals (Agriculture Handbook No. 287)

TOXICITY OF INSECTICIDES

All insecticides must be considered potentially toxic to man and animals. However, the degree of toxicity is only one of several factors in the use of insecticides that determine the hazard to man. *The primary hazard lies in failure to follow the precautions and directions for use indicated on the insecticide label and summarized in this Handbook.* These precautions and directions depend not only on the degree of toxicity and the nature of toxicity of the insecticide to be used, but also on its stability. Some of the highly toxic insecticides that must be handled with great caution dissipate so rapidly upon exposure on plants or animals or in the soil, that they create no serious residue hazard. On the contrary, some insecticides of low toxicity persist in the soil, on plants, and in meat and fat of animals that feed on these plants and may thus create critical residue problems.

In general, arsenical insecticides are very stable and may accumulate in the soil in quantities sufficient to injure plants. Small quantities are taken up by plants, which in time are eaten by animals.

Some of the chlorinated hydrocarbon insecticides also persist in the soil for years. Certain crops grown in such soils may pick up enough insecticide through contamination or translocation to exceed tolerances, even though the insecticide was not applied to them but to previous crops in the rotation. For example, enough aldrin or chlordane may persist in soil from year to year to contaminate such sensitive root crops as sugarbeet or carrot.

Organic phosphate insecticides generally are more acutely toxic to animals than chlorinated hydrocarbons, but they usually do not leave highly persistent residues, and they are less likely to accumulate in animal tissues. Diazinon and parathion applied to the soil become ineffective within 2 or 3 months and present no problems in rotations of crops. The persistence of insecticides is reflected in the waiting periods required between application and harvest. The toxicity of pesticides is a major factor reflected in the tolerances, but another important factor is need for the purpose. The tolerance must be set at a safe level as gaged by data in animal feeding studies; an adequate safety factor is used in translating animal data to man, but a tolerance is not established at a level higher than required for the purpose in accordance with good agricultural practive even if the toxicity of the pesticide is so low that a higher tolerance would be safe. Many factors must be considered in the selection of insecticides for specific purposes. However, if pertinent factors are about equal, preference should be given to insecticides that have low toxicity, persist only a short time, and do not accumulate in animal tissues.

The following two tables provide information on the acute toxicity of various insecticides. In the first table, acute oral and dermal LD_{50} values are given for most of the compounds included in this Handbook. An LD_{50} value is a statistical estimate of the dosage necessary to kill 50 percent of a population of white rats or other test animals within a specified period under standardized conditions in the laboratory. The toxicity of a chemical to such animals may vary, however, with species, age, sex, and nutritional state, and with the formulation of the insecticide and manner of administration. Also, the LD_{50} values are usually expressed in terms of a single dosage, which provides little or no information on possible cumulative effects of repeated dosages of the compound.

In the second table are given the acute LC_{50} values (lethal concentration) of some of the common insecticides for two fresh water fishes—rainbow trout and bluegills.

LD_{50} or LC_{50} values are useful in comparing different chemical compounds. However, they have certain limitations, and caution must be used in interpreting them in relation to actual use hazards. Since the values are obtained for other animals or fish, they can be applied to man only with reservations. Under comparable conditions and dosages, highly toxic substances present a greater hazard than those of low toxicity. However, such factors as dosage, frequency of application, and charactertistics with respect to accumulation and persistence in animal tissues must be considered. For example, a highly toxic material applied at a low dosage may be less hazardous than a much less toxic one used at a high dosage.

Acute Oral and Dermal LD_{50} Values of Insecticides for Test Animals

(Data assembled in 1965 by the Toxicology Section, Public Health Service, U.S. Department of Health, Education, and Welfare. Values are based on publications from several laboratories, and are for white rats unless otherwise indicated)

Insecticide	Oral LD_{50} (mg./kg.)		Dermal LD_{50} (mg./kg.)	
	Males	Females	Males	Females
Chlorinated Hydrocarbon Insecticides				
aldrin	39	60	98	98
benzene hexachloride	[1] 1,250	—	—	—
chlordane	335	430	840	690
chlorobenzilate	1,040	1,220	—	> 5,000
DDT	113	118	—	2,510
dichloropropane-dichloropropene	[1] 140	—	[1 2] 2,100	—
dicofol	1,100	1,000	1,230	1,000
dieldrin	46	46	90	60
Dilan	600	475	6,900	5,900
endosulfan	43	18	130	74
endrin	17.8	7.5	18	15
ethylene dibromide	146	117	[1 2 3] 300	—
ethylene dichloride	[1] 770	—	[1 2] 3,890	—
heptachlor	100	162	195	250
Kepone	125	125	> 2,000	> 2,000
lindane	88	91	1,000	900
methoxychlor	5,000	5,000	—	> 6,000
mirex	740	600	> 2,000	> 2,000
paradichlorobenzene	> 1,000	> 1,000	—	—
Perthane	> 4,000	> 4,000	—	—
Strobane	[1] 200	—	[1 2] > 5,000	—
TDE	> 4,000	> 4,000	[1 2] > 4,000	—
Telone	[1] 250–500	—	—	—
toxaphene	90	80	1,075	780

Acute Oral and Dermal LD_{50} Values of Insecticides for Test Animals —Con.

Insecticide	Oral LD_{50} (mg./kg.)		Dermal LD_{50} (mg./kg.)	
	Males	Females	Males	Females
Organic Phosphate Insecticides				
azinphosmethyl	13	11	220	220
Bidrin	[1] 22	—	[1 2] 225	—
carbophenothion	30	10	54	27
Ciodrin	[1] 125	—	[1 2] 385	—
Compound 4072	14.5	13	31	30
coumaphos	41	15.5	860	—
demeton	6.2	2.5	14	8.2
diazinon	108	76	900	455
dichlorvos	80	56	107	75
dimethoate	215	—	400	610
dioxathion	43	23	235	63
disulfoton	6.8	2.3	15	6
EPN	36	7.7	230	25
ethion	65	27	245	62
fenthion	215	245	330	330
malathion	1,375	1,000	> 4,444	> 4,444
methyl parathion	14	24	67	67
Methyl Trithion	98	120	215	190
mevinphos	6.1	3.7	4.7	4.2
naled	250	—	800	—
Nemacide	270	—	—	—
parathion	13	3.6	21	6.8
phorate	2.3	1.1	6.2	2.5
phosphamidon	23.5	23.5	143	107
ronnel	1,250	2,630	—	> 5,000
Ruelene	635	460	—	—
tepp	1.05	—	2.4	—
trichlorfon	630	560	> 2,000	> 2,000

Acute Oral and Dermal LD_{50} Values of Insecticides for Test Animals —Con.

Insecticide	Oral LD_{50} (mg./kg.) Males	Oral LD_{50} (mg./kg.) Females	Dermal LD_{50} (mg./kg.) Males	Dermal LD_{50} (mg./kg.) Females
Carbamate Insecticides				
carbaryl	850	500	> 4,000	> 4,000
Zectran	37	25	[4] 1,500–2,500	[4] 1,500–2,500
Other Insecticides				
Aramite	3,900	3,900	—	—
binapacryl	63	58	810	720
calcium arsenate	—	298	—	2,400
cryolite	[1] 200	—	—	—
dinitrobutylphenol	40	40	[1] [5] 150–200	—
dinitrocresol	31	31	[1] [5] 300–400	—
dinitrocyclohexylphenol	60	60	[1] [5] > 1,000	—
DN–111	[1] 330	—	[1] [5] > 1,000	—
fenson	[1] 1,350–1,740	—	—	—
Genite 923	[1] 500	—	—	—
lead arsenate	—	1,050	—	> 2,400
Lethane 384	90	—	[1] [2] 250–500	—
metaldehyde	[1] [6] ca. 1,000	—	—	—
Morestan	1,800	1,100	> 2,000	> 2,000
nicotine sulfate	—	83	—	285
ovex	[1] 2,050	—	—	—
paris green	—	100	—	> 2,400
pyrethrins	[1] > 1,500	—	[1] [2] > 1,880	—
pyrethrum	1,870	820	[1] [2] 2,060	—
rotenone	[1] 50–75	—	[1] [2] > 940	—
ryania	[1] 1,200	—	[1] [2] > 4,000	—
Sulphenone	[1] 1,400–3,650	—	—	—
tetradifon	[1] > 14,700	—	[1] [2] > 10,000	—
Thanite	[1] 1,600	—	[1] [2] 6,000	—

[1] Sex not indicated.
[2] Value for rabbits.
[3] Approximate LD_{50}.
[4] Estimated LD_{50}.
[5] Value for guinea pigs.
[6] Value for dogs.

Acute 24-Hour LC_{50} Values of Insecticides for Rainbow Trout and Bluegills

(Data provided in 1965 by Fish-Pesticide Research Laboratory, Bureau of Sport Fisheries and Wildlife, Department of the Interior. Values are based on amount of active ingredient and were determined by the Laboratory under standardized conditions, testing rainbow trout 43–58 mm. in length at 55° F., and bluegills 45–58 mm. in length at 75° F.)

Insecticide	LC_{50} for rainbow trout, in micrograms per liter	LC_{50} for bluegills, in micrograms per liter
aldrin	14	10
Aramite	730	480
carbaryl	3,500	3,400
chlordane	22	54
DDT	8	7
demeton	—	195
diazinon	380	54
dichlorvos	500	1,000
dicofol	110	—
dieldrin	6	14
dimethoate	20,000	28,000
endrin	0.7	0.8
fenthion	840	1,800
heptachlor	15	35
lindane	30	61
malathion	100	120
methoxychlor	20	31
methyl parathion	—	8,500
naled	70	220
ovex	860	870
parathion	2,000	56
Perthane	9	21
phosphamidon	4,500	—
pyrethrins	56	78
rotenone	32	24
Strobane	12	15
TDE	30	56
toxaphene	7.6	7.2

Acute 24-Hour LC_{50} Values of Insecticides for Rainbow Trout and Bluegills—Con.

Insecticide	LC_{50} for rainbow trout, in micrograms per liter	LC_{50} for bluegills, in micrograms per liter
trichlorfon	28,000	5,600
Zectran	6,500	16,000

CHEMICALS REFERRED TO IN THIS HANDBOOK

Name Used	Chemical Name
Abate®	*O,O*-dimethyl phosphorothioate *O,O*-diester with 4, 4′-thiodiphenol
acrylonitrile	acrylonitrile
aldrin	not less than 95 percent of 1, 2, 3, 4, 10,-10-hexachloro-1, 4, 4a, 5, 8, 8a-hexahydro-1,4-*endo-exo*-5, 8-dimethanonaphthalene
allethrin	2-allyl-4-hydroxy-3-methyl-2-cyclopenten-1-one ester of 2, 2-dimethyl-3-(2-methylpropenyl) cyclopropanecarboxylic acid
aluminum phosphide	aluminum phosphide
Aramite®	2-(*p-tert*-butylphenoxy) isopropyl 2-chloroethyl sulfite
azinphosmethyl (Guthion®).	*O, O*-dimethyl phosphorodithioate *S*-ester with 3-(mercaptomethyl)-1, 2, 3-benzotriazin-4(3*H*)-one
benzene hexachloride	1, 2, 3, 4, 5, 6-hexachlorocyclohexane, consisting of several isomers and containing a specified percentage of *gamma* isomer
Bidrin®	3-hydroxy-*N, N*-dimethyl-*cis*-crotonamide dimethyl phosphate
binapacryl	2-*sec*-butyl-4,6-dinitrophenyl 3-methyl-2-butenoate
calcium arsenate	calcium arsenate
calcium cyanide	calcium cyanide
carbaryl (Sevin®)	1-naphthyl methylcarbamate
carbon disulfide	carbon disulfide
carbon tetrachloride	carbon tetrachloride
carbophenothion (Trithion®).	*S*-[(*p*-chlorophenylthio)methyl] *O, O*-diethyl phosphorodithioate
chlordane	at least 60 percent of 1, 2, 4, 5, 6, 7, 8, 8-octachloro-2, 3, 3a, 4, 7, 7a-hexahydro-4, 7-methanoindene and not over 40 percent of related compounds
chlorobenzilate	ethyl 4, 4′-dichlorobenzilate
chloroform	chloroform
chloropicrin	trichloronitromethane
Ciodrin®	*alpha*-methylbenzyl 3-hydroxycrotonate dimethyl phosphate
Compound 4072	2-chloro-1-(2, 4-dichlorophenyl)-vinyl diethyl phosphate
coumaphos (Co-Ral®)	*O, O*-diethyl *O*-(3-chloro-4-methyl-2-oxo-2*H*-1-benzopyran-7-yl) phosphorothioate
cryolite	sodium hexafluoroaluminate
DDT	1, 1, 1-trichloro-2, 2-bis (*p*-chlorophenyl) ethane
demeton	mixture of *O, O*-diethyl *S* (and *O*)-[2-(ethylthio) ethyl] phosphorothioates
diazinon	*O, O*-diethyl *O*- (2-isopropyl-4-methyl-6-pyrimidinyl) phosphorothioate
dichloropropane-dichloropropene. (D-D® or Vidden®D)	dichloropropane-dichloropropene mixture
dichlorvos	2, 2-dichlorovinyl dimethyl phosphate
dicofol (Kelthane®)	4, 4′-dichloro-*alpha*-(trichloromethyl) benzhydrol
dieldrin	not less than 85 percent of 1, 2, 3, 4, 10, 10-hexachloro-6, 7-epoxy-1, 4, 4a,-5, 6, 7, 8 ,8a-octahydro-1, 4-*endo-exo*-5, 8-dimethanonaphthalene
Dilan®	a mixture of 1 part of 1, 1-bis (*p*-chlorophenyl)-2-nitropropane (Prolan®) and 2 parts of 1, 1-bis (*p*-chlorophenyl)-2-nitrobutane (Bulan®)
dimethoate	*O, O*-dimethyl *S*-(*N*-methylcarbamoylmethyl) phosphorodithioate
dinitrobutylphenol	2-*sec*-butyl-4, 6-dinitrophenol

Name Used	Chemical Name
dinitrocresol	4, 6-dinitro-*o*-cresol
dinitrocyclohexylphenol	2-cyclohexyl-4, 6-dinitrophenol
dioxathion (Delnav®)	*p*-dioxane-2, 3-diyl ethyl phosphorodithioate
diphenylamine	diphenylamine
disolfoton (Di-Syston®)	*O, O*-diethyl *S*-[2-(ethylthio) ethyl] phosphorodithioate
DN–111®	dicyclohexylamine salt of 2-cyclohexyl-4, 6-dinitrophenol
endosulfan (Thiodan®)	6, 7, 8, 9, 10, 10-hexachloro-1, 5, 5a,-6, 9, 9a-hexahydro-6, 9-methano-2, 4, 3-benzodioxathiepin 3-oxide
endrin	1, 2, 3, 4, 10, 10-hexachloro-6, 7-epoxy-1, 4, 4a, 5, 6, 7, 8, 8a-octahydro-1, 4-*endo-endo*-5, 8-dimethanonaphthalene
EPN	*O*-ethyl *O*-*p*-nitrophenyl phenylphosphonothioate
ethion	*O, O, O′, O′*-tetraethyl *S, S′*-methylenebisphosphorodithioate
ethyl formate	ethyl formate
ethylene dibromide	1, 2-dibromoethane
ethylene dichloride	1, 2-dichloroethane
ethylene oxide	ethylene oxide
fenson	*p*-chlorophenyl benzenesulfonate
fenthion (Baytex®)	*O, O*-dimethyl *O*-[4-(methylthio)-*m*-tolyl] phosphorothioate
Genite 923®	2, 4-dichlorophenyl benzenesulfonate
heptachlor	1, 4, 5, 6, 7, 8, 8-heptachloro-3a, 4, 7, 7a-tetrahydro-4, 7-methanoindene
hydrogen cyanide	hydrocyanic acid
Kepone®	decachloroöctahydro-1, 3, 4-metheno-2*H*-cyclobuta [*cd*]-pentalen-2-one
lead arsenate	acid lead arsenate
Lethane 384®	2-(2-butoxyethoxy) ethyl thiocyanate
lime sulfur	30 percent calcium polysulfide and various small amounts of calcium thiosulfate plus water and free sulfur
lindane	1, 2, 3, 4, 5, 6-hexachlorocyclo-hexane, *gamma* isomer of not less than 99 percent purity
malathion	*S*-[1, 2-bis (ethoxycarbonyl) ethyl] O, O-dimethyl phosphorodithioate
metaldehyde	metaldehyde
methoxychlor	1, 1, 1-trichloro-2, 2-bis (*p*-methoxyphenyl) ethane
methyl bromide	bromomethane
methyl chloride	chloromethane
methyl formate	methyl formate
methyl parathion	*O, O*-dimethyl *O*-*p*-nitrophenyl phosphorothioate
Methyl Trithion®	*S*-[[(*p*-chlorophenyl) thio] methyl] *O, O*-dimethyl phosphorodithioate
mevinphos (Phosdrin®)	methyl 3-hydroxy-*alpha*-crotonate dimethyl phosphate
mirex	dodecachloroöctahydro-1, 3, 4-metheno-2*H*-cyclobuta [*cd*]-pentalene
Morestan®	6-methyl-2, 3-quinoxalinedithiol cyclic *S, S*-dithiocarbonate
naled (Dibrom®)	1, 2-dibromo-2, 2-dichloroethyl dimethyl phosphate
naphthalene	naphthalene
Nemacide® (V–C 13)	*O*-2, 4-dichlorophenyl *O, O*-diethyl phosphorothioate
nicotine sulfate	nicotine sulfate
orthodichlorobenzene	*o*-dichlorobenzene
ovex	*p*-chlorophenyl *p*-chlorobenzene-sulfonate
paradichlorobenzene	*p*-dichlorobenzene
parathion	*O, O*-diethyl *O*-*p*-nitrophenyl phosphorothioate
paris green	copper acetoarsenite
Perthane®	a mixture of 1, 1-dichloro-2, 2-bis (*p*-ethylphenyl) ethane (95 percent) and related reaction products (5 percent)
phorate	*O, O*-diethyl *S*-[(ethylthio) methyl] phosphorodithioate
phosphamidon	2-chloro-2-diethylcarbamoyl-1-methylvinyl dimethyl phosphate
piperonyl butoxide	*alpha*-[2-(2-butoxyethoxy)-ethoxy]-4, 5-(methylenedioxy)-2-propyltoluene
propylene dichloride	1, 2-dichloropropane

Name Used	Chemical Name
propylene oxide	propylene oxide
pyrethrins	the active insecticidal constituents of pyrethrum
pyrethrum	dried flowers of *Chrysanthemum cinerariaefolium*
ronnel	*O, O*-dimethyl *O*-2, 4, 5-trichlorophenyl phosphorothioate
rotenone	the primary active compound of derris and cube roots
Ruelene®	4-*tert*-butyl-2-chlorophenyl methyl methylphosphoramidate
ryania	powdered stemwood of *Ryania speciosa*
sabadilla	ground seeds of sabadilla containing veratrine a complex mixture of alkaloids
Strobane®	terpene polychlorinates (65 percent chlorine)
sulfur	sulfur
Sulphenone®	*p*-chlorophenyl phenyl sulfone
TDE	1, 1-dichloro-2, 2-bis (*p*-chlorophenyl)-ethane
Telone®	mixed dichloropropenes
tepp	ethyl pyrophosphate
tetrachloroethylene	tetrachloroethylene
tetradifon (Tedion®)	*p*-chlorophenyl 2, 4, 5-trichlorophenyl sulfone
Thanite®	a mixture of isobornyl thiocyanoacetate (82 percent) and related compounds
toxaphene	chlorinated camphene containing 67-69 percent chlorine
trichlorfon	dimethyl (2, 2, 2-trichloro-1-hydroxyethyl) phosphonate
trichloroethylene	trichloroethylene
Zectran®	4-(dimethylamino)-3, 5-xylyl methylcarbamate

EXPLANATION OF TABLES THAT FOLLOW

The tables that follow list the insecticides to use in the control of the major insect pests and give the formulations to purchase, dosages to use, and brief instructions on where and when to apply them. The tables also include the legal tolerances for insecticide residues permitted on food or feed products, and the minimum time that must be allowed after applying the suggested dosages of insecticides in order to meet these tolerances. Other safety restrictions on the specific use of certain insecticides are given in the last column of the same page as the insecticide. Always read these safety restrictions to see if any of them apply to the insecticide that you plan to use and then observe those that are appropriate to your situation. For general precautions in the use of insecticides, see page iv.

With few exceptions the crops, insects, and insecticides are listed alphabetically. See page xii for the identification of the insecticides.

The insecticides listed for each insect are alternatives and are to be used separately unless mixtures of two or more materials are indicated by plus (+) signs.

"Formulation" refers to the form of the insecticide, usually as purchased. Dusts, baits, fumigants, aerosols, and granules are generally applied at the strength purchased. Emulsifiable concentrates, wettable powders, suspension concentrates, and powders are to be diluted with water unless otherwise indicated. The amount of water to use will depend on the output of the equipment.

A single entry in a box applies to all the insecticides and formulations opposite that box, except as specified.

A dash in the tolerance column means that no tolerance had been established at the time this guide was prepared. A dash in any other column indicates that there is no appropriate entry.

The following abbreviations are used:

Bait	B
Dust	D
Emulsifiable concentrate	EC
Fumigant	F
Granules	G
Spray	S
Wettable powder	WP
Solution	soln.

The insecticide dosages given in this Handbook are the maximums suggested for mature plants or animals. Often they may be reduced for immature plants or animals without loss in effectiveness. Effective dosages may also be reduced by careful attention to application techniques or by the use of highly efficient, well maintained equipment under favorable weather conditions. However, be careful not to exceed the suggested dosages except as indicated on the registered insecticide label. Dosages larger than those suggested in these tables may leave illegal residues on the harvested product unless more time is allowed between last application and harvest than is suggested in the table.

The principles followed in the commercial use of insecticides on crops, livestock, or stored products, should also be followed in their use in the home and the home garden. However, untrained persons should not use any of the insecticides labeled POISON and illustrated with the drawing of the skull and crossbones.

Trade names are used in this bulletin solely for the purpose of providing specific information. Mention of a trade name does not constitute a guarantee or warranty of the product by the U.S. Department of Agriculture.

BERRY INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BLACKBERRY, BOYSENBERRY, DEWBERRY, AND LOGANBERRY							
Aphids	Diazinon	0.75	--	D, EC, or WP	0.5	On foliage as needed.	Do not use parathion in home garden; should be applied only by a trained operator.
	Malathion	8	1	D, EC, or WP	1.7		
	Parathion	1	15	D, EC, or WP	0.5		
Japanese beetle (Popillia japonica)	Carbaryl	12	7	D or WP	1.5		
	DDT	7	--	D, EC, or WP	1.5		Do not apply DDT or diazinon when fruit is present.
	Malathion	8	1	D, EC, or WP	1.7		
Orange tortrix (Argyrotaenia citrana)	TDE	7	14	D, EC, or WP	2	On foliage in Northwest when first blossoms appear	
Raspberry crown borer (Bembecia marginata)	DDT	7	--	D, EC, or WP	1.5	On lower canes and crown; first week in October.	
	Diazinon	0.75	--	EC	0.5		
	Parathion	1	15	EC or WP	0.75		
Raspberry fruitworms (Byturus spp.) and raspberry sawfly (Monophadnoides geniculatus)	DDT	7	--	D, EC, or WP	1.5	On foliage when blossom buds first appear and just before blossoms open.	
	Rotenone	Exempt	1	D, extract, or powder	0.3		
Redberry mite (Aceria essigi)	Lime sulfur	Safe	--	6 gal./100 gal.	100 gal. soln.	On dormant plants only.	
				2.5 gal./100 gal.	100 gal. soln.	On plants when fruit spurs are 1 ft. long.	
Red-necked cane borer (Agrilus ruficollis)	DDT	7	--	D, EC, or WP	1.5	On foliage just before plants bloom; repeat rotenone in about 2 weeks.	
	Rotenone	Exempt	1	D, extract, or powder	0.3		

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BERRY INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BLACKBERRY, BOYSENBERRY, DEWBERRY, AND LOGANBERRY							
Rose chafer (Macrodactylus subspinosus)	Carbaryl	12	7	D or WP	1.5	On foliage as needed.	Do not use demeton in home plantings; should be applied only by a trained operator. Do not apply aldrin, chlordane, DDT, demeton, or dieldrin when fruit is present.
	DDT	7	--	D, EC, or WP	1.5		
	Methoxychlor	14	3	D or WP	1.7		
Rose leafhopper (Edwardsiana rosae)	DDT	7	--	D, EC, or WP	1.5		
	Malathion	8	1	D, EC, or WP	1.7		
Rose scale (Aulacaspis rosae)	Malathion	8	1	D, EC, or WP	1.7		
	Dormant oil	Exempt	--	EC	3 gal. EC/100 gal.	On dormant plants only.	
Spider mites (Tetranychus spp.)	Demeton	--	--	EC	0.3 - 0.5	On foliage as needed. Apply demeton after harvest, in late summer or fall.	
	Dicofol	5	2	EC or WP	0.8 - 1.2		
Stink bugs	Carbaryl	12	7	D or WP	2		
	DDT	7	--	D, EC, or WP	1.5		
Strawberry weevil (Anthonomus signatus)	DDT	7	--	D, EC, or WP	1.5	On foliage when insects first appear.	
	Methoxychlor	14	3	D or WP	1.7		
White grubs	Aldrin	--	--	EC or WP	2	Broadcast on soil and thoroughly work into upper 4 - 6 in.	Do not repeat soil application of aldrin, chlordane, or dieldrin for at least 3 years.
	Chlordane	0.3	--	EC or WP	10		
	Dieldrin	--	--	EC or WP	2		
BLUEBERRY							
Blueberry tip borer (Rhopoboda naevana)	Carbaryl + Malathion	10 + 8	1	WP	1 + 0.5	Just after petal fall, 10 days later, and 20 days later.	Do not use azinphosmethyl in home plantings; should be applied only by a trained operator.
	Azinphosmethyl	2	14	WP	0.4		

BERRY INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BLUEBERRY							
Cherry fruitworm (Grapholitha packardi)	Azinphosmethyl	2	14	WP	0.4	3 applications at 10-day intervals, beginning just after petal fall.	Do not use azinphosmethyl in home plantings; should be applied only by a trained operator.
	Carbaryl	10	1	WP	1		
	Malathion	8	1	WP	0.5		
Japanese beetle (Popillia japonica)	Carbaryl	10	1	WP	1.5	On foliage when adults appear; repeat as needed.	
	Malathion	8	1	D or EC	1		
CURRANT AND GOOSEBERRY							
Currant aphid (Cryptomyzus ribis)	Malathion	8	3	WP	2	As leaf buds are opening or later if infestation occurs.	Do not use tepp in home plantings; should be applied only by a trained operator.
Gooseberry fruitworm (Zophodia convolutella)	Rotenone	Exempt	1	D or WP	0.3 - 0.4	When webbing is observed and 7 - 10 days later.	
Imported currantworm (Nematus ribesii)	Lead arsenate	7 (combined lead)	--	D or powder	3 - 4	Soon after leaves appear.	Do not apply lead arsenate when fruit is present.
	Malathion	8	3	WP	2	When worms appear.	
	Rotenone	Exempt	1	D or WP	0.25 - 0.4		
San Jose scale (Aspidiotus perniciosus)	Lime sulfur	Safe	--	Liquid	24 gal.	Dormant.	
	Mineral oil	Exempt	--	EC or emulsion	Superior oil 4 gal. Other oil 6 gal.		
Spider mites (Tetranychus spp.)	Malathion	8	3	D, EC, or WP	2	When infestation appears and 7 - 10 days later.	
	Tepp	0	3	EC	0.4		

BERRY INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
RASPBERRY							
Aphids	Diazinon	0.75	--	D, EC, or WP	0.5	On foliage as needed.	Do not use parathion in home plantings; should be applied only by a trained operator.
	Malathion	8	1	D, EC, or WP	1.7		
	Parathion	1	15	D, EC, or WP	0.5		
Japanese beetle (Popillia japonica)	Carbaryl	12	7	D or WP	2		Do not apply DDT or diazinon when fruit is present.
	DDT	7	--	D, EC, or WP	1.5		
	Malathion	8	1	D, EC, or WP	1.7		
Oblique-banded leaf roller (Choristoneura rosaceana)	DDT	7	--	D, EC, or WP	1.5		
	TDE	7	14	D, EC, or WP	2		
Orange tortrix (Argyrotaenia citrana)	TDE	7	14	D, EC, or WP	2	On foliage in Northwest when first blossoms appear.	
Raspberry crown borer (Bembecia marginata)	Diazinon	0.75	--	EC	0.5	On lower canes and crowns, first week in October.	
	Parathion	1	15	EC or WP	0.75		
Red-necked cane borer (Agrilus ruficollis)	DDT	7	--	D, EC, or WP	1.5	On foliage just before plants bloom; repeat rotenone in 2 weeks.	
	Rotenone	Exempt	1	D, extract, or powder	0.3		
Raspberry fruitworms (Byturus spp.) and raspberry sawfly (Monophadnoides geniculatus)	DDT	7	--	D, EC, or WP	1.5	On foliage when blossom buds appear and just before blossoms open.	
	Rotenone	Exempt	1	D, extract, or powder	0.3		
Rose chafer (Macrodactylus subspinosus)	Carbaryl	12	7	D or WP	1	On foliage as needed.	
	DDT	7	--	D, EC, or WP	1.5		
	Methoxychlor	14	3	D or WP	1.7		

BERRY INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
RASPBERRY							
Rose scale (Aulacaspis rosae)	Malathion	8	1	D, EC, or WP	1.7	On foliage as needed.	
	Dormant oil	Exempt	--	EC	0.5 pt. EC/gal.	On dormant plants only.	
Spider mites (Tetranychus spp.)	Kelthane	5	2	EC or WP	1	On foliage as needed.	
Stink bugs	Carbaryl	12	7	D or WP	2		
	DDT	7	--	D, EC, or WP	1.5		Do not apply aldrin, chlordane, DDT, or dieldrin when fruit is present.
Strawberry weevil (Anthonomus signatus)	DDT	7	--	D, EC, or WP	1.5	On foliage when insects appear.	
	Methoxychlor	14	3	D or WP	1.7		
White grubs	Aldrin	--	--	EC or WP	2	Broadcast on soil and thoroughly work into upper 4 - 6 in.	Do not repeat soil application of aldrin, chlordane, or dieldrin for at least 3 years.
	Chlordane	0.3	--	EC or WP	10		
	Dieldrin	--	--	EC or WP	2		
STRAWBERRY							
Ants	Aldrin	0.1	--	EC or WP	5	To soil surface before planting and work into upper 6 - 8 in.	Do not use carbophenothion or demeton in home garden; should be applied only by a trained operator.
	Chlordane	0.3	--	EC or WP	10		
	Dieldrin	0.1	--	EC or WP	3		
	Chlordane			Drench: 5 oz. 40% WP or 4 fl. oz. 45% EC/100 gal.	100 gal. drench/ 1,000 sq. ft.	On soil as needed.	Do not apply aldrin, chlordane, or dieldrin when fruit is present.
Aphids on foliage	Carbophenothion	0.8	3	EC or WP	0.5	On foliage as needed.	
	Demeton	0.75	21	EC	0.25		Do not reapply endosulfan within 15 days or more than twice within a 35-day period when fruit is present.
	Diazinon	0.75	5	EC or WP	1		
	Endosulfan	2	4	D, EC, or WP	0.5 - 1.0		

Continued

BERRY INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
STRAWBERRY							
Aphids on foliage (con.)	Malathion*	8	3	D, EC, or WP	1-2	On foliage as needed.	Do not use methyl bromide, mevinphos, parathion, or tepp in home garden; should be applied only by a trained operator.
	Mevinphos	1	1	D, EC, or WP	1		
	Parathion*	1	14	D, EC, or WP	0.5		
	Tepp	0	3	D or EC	0.5		
Cutworms	DDT	7	--	D, EC, or WP	2	On soil as needed.	Do not apply chlordane, DDT, or toxaphene when fruit is present.
	Toxaphene	7	--	D, EC, or WP 3% B	2 0.6		
Cyclamen mite (Steneotarsonemus pallidus)	Endosulfan	2	4	EC or WP	4	On foliage in 800 gal. of spray at high pressure. Do not repeat application at this rate within 35 days.	Do not reapply endosulfan within 15 days or more than twice within a 35-day period when fruit is present. Apply methyl bromide only during dormant season and only on Shasta and Lassen varieties.
	Methyl bromide	30 (inorganic bromide	--	Fumigant	109	Apply under tarpaulin according to manufacturer's directions.	
	Hot water	--	--	--	--	To treat dormant plants, immerse in hot water (100° F.) for 20 min.	
Earwigs	Chlordane	0.3	--	D, EC, or WP	1	To infested soil in and adjacent to planting.	
Field crickets (Gryllus spp.)	Chlordane	0.3	--	3% B	1.2	To soil surface in late afternoon after rain or irrigation.	
	Malathion	8	3	D, EC, or WP	1-2	On foliage as needed.	
Flea beetles	DDT	7	--	D, EC, or WP	1-2		
	Methoxychlor	14	3	D or WP	1-2		

*Do not use malathion or parathion where cyclamen mite is a problem.

BERRY INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
STRAWBERRY							
Lygus bugs	DDT	7	--	D, EC, or WP	1-2	On foliage as needed.	Do not use carbophenothion, demeton, parathion, or tepp in home garden; should be applied only by a trained operator. Do not apply chlordane or DDT dust or spray when fruit is present.
	Malathion	8	3	D, EC, or WP	1-2		
	Parathion	1	14	D, EC, or WP	0.5		
Mole crickets	Chlordane	0.3	--	3% B D, EC, or WP	1.2	On soil as needed.	
Omnivorous leaf tier (Cnephasia longana)	Methoxychlor	14	3	5% D	1-2	On foliage as needed.	
Potato leafhopper (Empoasca fabae)	Malathion	8	3	D, EC, or WP	1-2		
	Parathion	1	14	D	0.5		
Slugs and snails	Metaldehyde + Chlordane	None + 0.3	6	2.5% + 5% B	0.3-0.5	Broadcast on soil late in day when damage is observed.	
	Metaldehyde + Calcium arsenate	None + 3.5 combined As_2O_3	6	2.5% + 5% B	0.3-0.5		
Spider mites (Tetranychus spp.)	Carbophenothion	0.8	3	D EC or WP	1.2 0.5	On foliage as needed.	
	Demeton	0.75	21	EC	0.25		
	Diazinon	0.75	5	D EC or WP	1.2 1		
	Dicofol	5	2	D, EC, or WP	0.8		
	Malathion (home garden only)	8	3	D, EC, or WP	1-2		
	Tepp	0	3	D or EC	0.5		Do not apply tetradifon during fruiting period at intervals of less than 35 days.
	Tetradifon	5	3	D or EC	1		

BERRY INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
STRAWBERRY							
Spittlebugs	Endosulfan	2	4	EC or WP	0.5-1.0	On foliage when spittle masses are seen.	Do not apply parathion in home garden; should be applied only by a trained operator. Do not reapply endosulfan within 15 days or more than twice within a 35-day period when fruit is present. Do not repeat soil application of aldrin, chlordane, or dieldrin for at least 3 years. Do not apply chlordane, DDT, or toxaphene when fruit is present.
	Malathion	8	3	D, EC, or WP	1-2		
	Methoxychlor	14	3	D or WP	1-2		
Strawberry crown borer (Tyloderma fragariae)	Chlordane	0.3	--	D, EC, or WP	1	On foliage as needed.	
	Toxaphene	7	--	D, EC, or WP	3		
Strawberry crown miner (Aristotelia fragariae)	DDT	7	--	D, EC, or WP	1-2		
Strawberry leaf beetle (Paria fragariae)	DDT	7	--	D, EC, or WP	1-2		
	Methoxychlor	14	3	D or WP	1-2		
Strawberry leaf roller (Ancylis comptana fragariae)	Carbaryl	10	1	WP	2		
	Malathion	8	3	D, EC, or WP	1-2		
	Parathion	1	14	D, EC, or WP	0.5		
	TDE	7	5	D, EC, or WP	2		
Strawberry root weevil (Brachyrhinus ovatus)	Aldrin	0.1	--	EC or WP	5	To soil surface before planting and work into upper 6-8 inches.	
	Chlordane	0.3	--	EC or WP	10		
	Dieldrin	0.1	--	EC or WP	5		
	Malathion	8	3	D, EC, or WP	1-2	On foliage as needed.	
	Parathion	1	14	D, EC, or WP	0.5		
Strawberry weevil (Anthonomus signatus)	DDT	7	--	D, EC, or WP	1-2		
	Methoxychlor	14	3	D or WP	1-2		

BERRY INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
STRAWBERRY							
Sugarcane beetle (Euetheola rugiceps)	Aldrin	0.1	--	G	1	In new plantings when needed. Spread in 6 - 8 in. band in plant row.	Do not use parathion in home garden; should be applied only by a trained operator. Do not apply aldrin, DDT, or toxaphene when fruit is present. Do not repeat soil application of aldrin, chlordane, DDT, or dieldrin for at least 3 years.
Thrips	Malathion	8	3	D, EC, or WP	1 - 2	On foliage as needed.	
	Toxaphene	7	--	D or EC	3		
Whiteflies	DDT	7	--	D, EC, or WP	1 - 2		
	Malathion	8	3	D, EC, or WP	1 - 2		
	Parathion	1	14	D, EC, or WP	0.5		
White grubs	Aldrin	0.1	--	EC, G, or WP	3	Broadcast on soil before planting and thoroughly work into upper 4 - 6 in.	
	Chlordane	0.3	--	EC, G, or WP	10		
	Dieldrin	0.1	--	EC, G, or WP	3		
Wireworms							
In East	Aldrin	0.1	--	EC, G, or WP	2 - 3	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in.	
	Chlordane	0.3	--	EC, G, or WP	4 - 8		
	Dieldrin	0.1	--	EC, G, or WP	2 - 3		
In West	DDT	7	--	EC, G, or WP	10	Apply at least 6 weeks before planting and thoroughly work into upper 6 - 9 in.	
	Ethylene dibromide	5 (inorganic bromide)	--	83% soln., (12 lb./gal.)	36	Inject 8 in. into fallow soil every 12 inches.	Do not apply ethylene dibromide within 3 weeks before planting.

COTTON INSECTS

INSECT	INSECTICIDE	TOLERANCE *(cottonseed) (p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HAND HARVEST	FORMULATION	DOSAGE PER ACRE *(pounds of active ingredient unless otherwise indicated)*	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
Beet armyworm (Spodoptera exigua)	Trichlorfon*	--	7**	Soluble powder	1 - 1.5	On foliage as needed.	See page 16.
Boll weevil (Anthonomus grandis)	Aldrin	--	--	D or EC	0.25 - 0.5	On foliage every 3-7 days until controlled.	
	Azinphosmethyl*	0.5	1**	D or EC	0.25 - 0.5		
	Calcium arsenate*	--	--	D	7 - 15		
	Carbaryl*	5	--	D or WP	1 - 2.5		
	Dieldrin	--	5	D or EC	0.15 - 0.5		
	Endrin	0	5	D or EC	0.2 - 0.5		
	Heptachlor	0	--	D or EC	0.25 - 0.5		
	Malathion*	2	--	D or EC	1 - 2		
	Methyl parathion*	--	5	D or EC	0.25 - 0.5		
	Methyl Trithion*	--	--	D or EC	0.25 - 0.5		
	Strobane	5	--	D or EC	2 - 4		
	Toxaphene	5	--	D or EC	2 - 4		
Bollworms (Heliothis zea and H. virescens)	Carbaryl	5	--	D or WP	1 - 2.5	On foliage every 5-7 days until controlled.	
	DDT	4	--	D or EC	0.5 - 3		
	Endrin	0	5	D or EC	0.2 - 0.5		
	Methyl parathion*	--	5	D or EC	1		
	Strobane	5	--	D or EC	2 - 4.8		
	TDE	--	--	D or EC	1 - 1.5		
	Toxaphene	5	--	D or EC	2 - 6		
Brown cotton leafworm (Acontia dacia)	Azinphosmethyl*	0.5	1**	D or EC	0.25	On foliage as needed.	
	Endrin	0	5	D or EC	0.33		
	Malathion	2	--	D or EC	0.25		
	Parathion	--	5	D or EC	0.12		
Cabbage looper (Trichoplus ni)	Endosulfan	--	--	D or EC	1		
	Endrin	0	5	D or EC	0.2 - 0.7		
	Methyl parathion	--	5	D or EC	0.5 - 1		
Cotton aphid (Aphis gossypii)	Bidrin	--	10**	EC	0.1 - 0.3		
	Carbophenothion	0.2	--	D or EC	0.38 - 1		
	Demeton	0.75	21**	EC	0.12 - 0.4		
	Ethion	--	--	EC	0.38 - 1		
	Malathion	2	--	D or EC	0.5 - 1		
	Methyl parathion	--	5	D or EC	0.25 - 0.5		

Continued

*Use when insect is resistant to other insecticides.

**Applies to all types of harvest.

INSECT	INSECTICIDE	TOLERANCE *(cottonseed) (p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HAND HARVEST	FORMULATION	DOSAGE PER ACRE *(pounds of active ingredient unless otherwise indicated)*	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
Cotton aphid (Aphis gossypii) (con.)	Methyl Trithion	--	--	D or EC	0.25 - 0.5	On foliage as needed.	See page 16
	Parathion	--	5	D or EC	0.1 - 0.38		
	Phosphamidon	--	14**	D or EC	0.25 - 0.5		
	Disulfoton	0.75	--	D or G	0.5 - 1	To seed, or as granules in furrow at planting.	
	Phorate	--	--	D, EC, or G	0.5 - 1		
Cotton fleahopper (Psallus seriatus)	Aldrin	--	--	D or EC	0.15 - 0.5	On foliage as needed.	
	Azinphosmethyl	0.5	1**	D or EC	0.15 - 0.4		
	Benzene hexachloride	--	--	D or EC	0.25 - 0.4		
	Bidrin*	--	10**	EC	0.1 - 0.3		
	Carbaryl*	5	--	D or WP	0.7 - 2		
	DDT	4	--	D or EC	0.5 - 2		
	Diazinon	--	14**	D or EC	0.5		
	Dieldrin	--	5	D or EC	0.1 - 0.25		
	Endrin	0	5	D or EC	0.1 - 0.25		
	Heptachlor	0	--	D or EC	0.15 - 0.38		
	Malathion*	2	--	D or EC	0.7 - 1.25		
	Methyl parathion*	--	5	D or EC	0.15 - 0.25		
	Naled	--	4	D or EC	1.0		
	Phosphamidon	--	14**	D or EC	0.5		
	Strobane	5	--	D or EC	1.5 - 4		
	TDE	--	--	D or EC	1 - 1.5		
	Toxaphene	5	--	D or EC	1.5 - 4		
	Trichlorfon	--	7**	Soluble powder	1 - 1.5		
Cotton leaf perforator (Bucculatrix thurberiella)	Bidrin*	--	10**	EC	0.3		
	Carbophenothion*	0.2	--	D or EC	1.0		
	Diazinon*	--	14**	D or EC	0.5		
	Dilan	--	14**	D or EC	0.7		
	Malathion*	2	--	D or EC	0.6		
	Methyl parathion*	--	5	D or EC	0.5		
	Methyl Trithion*	--	--	D or EC	0.5		
	Naled*	--	4	D or EC	1.0		
	Trichlorfon*	--	7**	Soluble powder	1.0		
Cotton leafworm (Alabama argillacea)	Azinphosmethyl	0.5	1**	D or EC	0.25 - 0.38		
	Calcium arsenate*	--	--	D or WP	7 - 10		
	Carbaryl*	5	--	D or WP	1 - 2.5		

Continued

*Use when insect is resistant to other insecticides.

**Applies to all types of harvest.

COTTON INSECTS

INSECT	INSECTICIDE	TOLERANCE *(cottonseed) (p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HAND HARVEST	FORMULATION	DOSAGE PER ACRE *(pounds of active ingredient unless otherwise indicated)*	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
Cotton leafworm (Alabama argillacea) (con.)	Endrin	0	5	D or EC	0.2 - 0.5	On foliage as needed.	See page 16.
	Malathion*	2	--	D or EC	0.25 - 1.25		
	Methyl parathion*	--	5	D or EC	0.12 - 0.38		
	Methyl Trithion*	--	--	D or EC	0.12 - 0.25		
	Parathion*	--	5	D or EC	0.12 - 0.25		
	Strobane	5	--	D or EC	2		
	Toxaphene	5	--	D or EC	2		
	Trichlorfon*	--	7**	Soluble powder	0.12 - 0.25		
Cutworms	DDT	4	--	D or EC	1 - 2	On lower portion of plants and soil surface around plants as needed.	
	Dieldrin	--	5	D or EC	0.15 - 0.3		
	Endrin	0	5	D or EC	0.2 - 0.5		
	Methyl parathion*	--	5	D or EC	0.5 - 1		
	Strobane	5	--	D or EC	2 - 4		
	Toxaphene	5	--	D or EC	2 - 4		
Fall armyworm (Spodoptera frugiperda)	Carbaryl	5	--	D or WP	1 - 2	On foliage as needed.	
	DDT	4	--	D or EC	1 - 2		
	Endrin	0	5	D or EC	0.2 - 0.4		
	Heptachlor	0	--	D or EC	0.25 - 0.4		
	Malathion	2	--	D or EC	1.25		
	Methyl parathion	--	5	D or EC	0.25		
	Strobane	5	--	D or EC	2 - 4		
	Toxaphene	5	--	D or EC	2 - 4		
False wireworms Adults on young plants	DDT	4	--	D or EC	1 - 1.5		
	Dieldrin	--	5	D or EC	0.4		
	Endrin	0	5	D or EC	0.3		
	Heptachlor	0	--	D or EC	0.3 - 0.5		
False wireworms and wireworms	Aldrin	--	--	Slurry seed treatment with suitable fungicide	1 to 2 oz./100 lb. seed	Mix slurry with seed and dry before planting.	
	Dieldrin	--	--				
	Endrin	--	--				
	Heptachlor	--	--				
	Lindane	--	--				
Field crickets (Gryllus spp.)	Dieldrin	--	5	D or EC	0.4 - 0.75	On foliage as needed.	
	Endrin	0	5	D or EC	0.4		

*Use when insect is resistant to other insecticides.
**Applies to all types of harvest.

INSECT	INSECTICIDE	TOLERANCE *(cottonseed) (p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HAND HARVEST	FORMULATION	DOSAGE PER ACRE *(pounds of active ingredient unless otherwise indicated)*	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
Flea beetles (Systena spp.)	Aldrin	—	--	D or EC	0.25 - 0.5	On foliage as needed.	See page 16.
	DDT	4	--	D or EC	1		
	Dieldrin	--	5	D or EC	0.25 - 0.33		
	Toxaphene	5	--	D or EC	2 - 3		
Garden webworm (Loxostege similalis)	Azinphosmethyl	0.5	1*	D or EC	0.25 - 0.5		
	Carbaryl	5	--	D or WP	1 - 2.5		
	DDT	4	--	D or EC	1 - 2		
	Dieldrin	--	5	D or EC	0.25 - 0.5		
	Endrin	0	5	D or EC	0.2 - 0.4		
	Heptachlor	0	--	D or EC	0.25 - 0.5		
	Malathion	2	--	D or EC	1 - 2		
	Methyl parathion	--	5	D or EC	0.25 - 0.5		
	Strobane	5	--	D or EC	2 - 4		
	Toxaphene	5	--	D or EC	2 - 4		
Grasshoppers	Aldrin	--	--	D or EC	0.1 - 0.38		
	Carbaryl	5	--	D or WP	1 - 2		
	Dieldrin	--	5	D or EC	0.2 - 0.25		
	Endrin	0	5	D or EC	0.2 - 0.4		
	Heptachlor	0	--	D or EC	0.25 - 0.5		
	Malathion	2	--	D or EC	1 - 2		
	Methyl parathion	--	5	D or EC	0.25		
	Naled	--	4	D or EC	0.25 - 0.5		
	Strobane	5	--	D or EC	2 - 4		
	Toxaphene	5	--	D or EC	2 - 4		
Greenhouse leaf tier (Udea rubigalis)	Endrin	0	5	D or EC	0.4		
Leaf rollers	Carbaryl	5	--	D or WP	2		
	Trichlorfon**	--	7*	Soluble powder	1		
Lygus bugs and other mirids	Aldrin	--	--	D or EC	0.15 - 0.25		
	Azinphosmethyl**	0.5	1*	D or EC	0.12 - 0.25		
	Benezene hexachloride	--	--	D or EC	0.25 - 0.5		
	Bidrin**	--	10*	EC	0.1 - 0.3		
	Carbaryl*	5	--	D or WP	0.7 - 2		
	Carbophenothion	0.2	--	D or EC	1.0		
Continued	DDT	4	--	D or EC	0.6 - 2		

*Applies to all types of harvest.

**Use when insect is resistant to other insecticides.

INSECT	INSECTICIDE	TOLERANCE *(cottonseed) (p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HAND HARVEST	FORMULATION	DOSAGE PER ACRE *(pounds of active ingredient unless otherwise indicated)*	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
Lygus bugs and other mirids (con.)	Diazinon*	--	14**	D or EC	0.5	On foliage as needed.	See page 16.
	Dieldrin	--	5	D or EC	0.1 - 0.45		
	Dimethoate	--	14**	D or EC	0.25		
	Endrin	0	5	D or EC	0.1 - 0.5		
	Heptachlor	0	--	D or EC	0.15 - 0.5		
	Malathion*	2	--	D or EC	0.5 - 2		
	Methyl parathion*	--	5	D or EC	0.15 - 0.25		
	Methyl Trithion*	--	--	D or EC	0.5		
	Naled*	--	4	D or EC	1		
	Phosphamidon*	--	14**	D or EC	0.5		
	Strobane	5	--	D or EC	1.5 - 4		
	Toxaphene	5	--	D or EC	1.5 - 4		
	Trichlorfon*	--	7**	Soluble powder	0.25 - 1		
Pink bollworm (Pectinophora gossypiella)	Carbaryl	5	--	D or WP	1.5 - 2.5	On foliage every 5 - 7 days until controlled.	
	DDT	4	--	D or EC	1.5 - 3		
Potato leafhopper (Empoasca fabae)	DDT	4	--	D or EC	1 - 1.5	On foliage as needed.	
Salt-marsh caterpillar (Estigmene acrea)	Carbaryl	5	--	D or WP	2		
	Diazinon	--	14**	D or EC	0.5		
	Dilan	--	14**	D or EC	0.6		
	Methyl parathion	--	5	D or EC	1.0		
	Parathion	--	5	EC	0.5		
	Trichlorfon	--	7**	Soluble powder	1.5		
Southern garden leafhopper (Empoasca solana)	Demeton	0.75	21**	EC	0.25		
	Malathion	2	--	EC	1		
	Parathion	--	5	EC	0.5		
	Trichlorfon	--	7**	Soluble powder	1		
Spider mites	Aramite*	--	--	D or EC	0.25 - 1		
	Bidrin	--	10**	EC	0.1 - 0.25		
	Carbophenothion	0.2	--	D or EC	0.25 - 1		
	Chlorbenzilate*	--	--	EC	0.5 - 1		
	Demeton	0.75	21**	EC	0.12 - 0.38		
	Dicofol*	0.1	14**	D or EC	0.5 - 1.2		
	Ethion	--	--	D or EC	0.25 - 1		
Continued	Malathion***	2	--	D or EC	0.25 - 0.5		

*Use when insect is resistant to other insecticides.
**Applies to all types of harvest.
***Does not control all species.

Use Pesticides Safely—Follow the Label

COTTON INSECTS

INSECT	INSECTICIDE	TOLERANCE *(cottonseed) (p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HAND HARVEST	FORMULATION	DOSAGE PER ACRE *(pounds of active ingredient unless otherwise indicated)*	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
Spider mites (con.)	Methyl parathion***	--	5	D or EC	0.25 - 0.38	On foliage as needed.	See page 16.
	Parathion	--	5	D or EC	0.1 - 1		
	Sulfur	--	--	D	20 - 35		
	Tetradifon	--	--	D or EC	0.5		
	Disulfoton	0.75	--	D or G	0.5 - 1	To seed, or as granules in furrow at planting.	
	Phorate	--	--	D, EC, or G	0.5 - 1		
Stink bugs	Benezene hexachloride	--	--	D or EC	0.5	On foliage as needed.	
	Carbaryl	5	--	WP	1 - 2.5		
	Carbophenothion	0.2	--	D or EC	1.0		
	DDT	4	--	D or EC	1		
	Dieldrin	--	5	D or EC	0.4 - 0.5		
	Endosulfan	--	--	D or EC	1		
	Endrin	0	5	D or EC	0.5		
	Methyl parathion*	--	5	D or EC	1		
	Methyl Trithion	--	--	D or EC	0.5		
	Parathion*	--	5	D or EC	0.5		
	Trichlorfon*	--	7**	Soluble powder	1 - 1.5		
Thrips	Aldrin	--	--	D or EC	0.08 - 0.2		
	Azinphosmethyl*	0.5	1**	D or EC	0.08 - 0.25		
	Benezene hexachloride	--	--	D or EC	0.13 - 0.45		
	Bidrin*	--	10**	EC	0.1 - 0.25		
	Carbaryl*	5	--	D or WP	0.35 - 1		
	DDT	4	--	D or EC	0.25 - 0.5		
	Dieldrin	--	5	D or EC	0.05 - 0.4		
	Endrin	0	5	D or EC	0.07 - 0.15		
	Heptachlor	0	--	D or EC	0.08 - 0.5		
	Malathion*	2	--	D or EC	0.3 - 1		
	Methyl parathion*	--	5	D or EC	0.12 - 0.2		
	Methyl Trithion	--	--	D or EC	0.25		
	Parathion	--	5	D or EC	0.2 - 0.25		
	Phosphamidon	--	14**	D or EC	0.2		
	Strobane	5	--	D or EC	0.8 - 3		
	Toxaphene	5	--	D or EC	0.8 - 3		
	Disulfoton*	0.75	--	D or EC	0.3 - 1	To seed, or as granules in furrow at planting.	
	Phorate*	--	--	D, EC, or G	0.3 - 1		

*Use when insect is resistant to other insecticides.

* *Applies to all types of harvest.

***Does not control all species.

INSECT	INSECTICIDE	TOLERANCE *(cottonseed) (p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HAND HARVEST	FORMULATION	DOSAGE PER ACRE *(pounds of active ingredient unless otherwise indicated)*	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
White-fringed beetles	Aldrin	--	--	D, EC, or G	Broadcast 2 In row 0.75 - 1	Broadcast on soil when preparing for planting and immediately work into upper 3 inches or apply with fertilizer, in row at time of planting.	See below.
	Chlordane	--	--	D, EC, or G	Broadcast 5 In row 1 - 2		
	DDT	4	--	D, EC, or G	Broadcast 10 In row 2 - 3		
	Dieldrin	--	--	D, EC, or G	Broadcast 1.5 In row 0.5 - 0.75		
	Heptachlor	0	--	D, EC, or G	Broadcast 2 In row 0.75 - 1		
Yellow-striped armyworm (Prodenia ornithogalli)	Dieldrin	--	5	D or EC	0.25 - 0.45	On foliage as needed.	
	Toxaphene	5	--	D or EC	2 - 3		

SAFETY RESTRICTIONS

Azinphos methyl, carbophenothion, demeton, methyl parathion, and parathion are highly toxic: Use adequate precautions in applying.

Unused cottonseed intended for planting that has been treated with any insecticide should not be used for food or feed.

Workers entering cottonfields within 5 days after plants have been treated with endrin, or on the day plants are treated with methyl parathion, should wear clean, tightly woven, protective clothing.

Do not apply aldrin, chlordane, chlorbenzilate, endosulfan, ethion, heptachlor, or tetradifon after bolls begin to open.

Do not apply Aramite after bolls begin to open (30 days before harvest).

Do not apply Dilan in excess of 1 pound per acre per application or Strobane or toxaphene in excess of 4 pounds per acre after bolls open.

Do not apply Methyl Trithion after half of the bolls are open.

Do not apply benezene hexachloride to cotton in rotation with root crops.

Do not graze livestock in cottonfields treated with aldrin, Aramite, benezene hexachloride, Bidrin, carbophenothion, chlordane, chlorbenzilate, DDT, demeton, diazinon, dicofol, dieldrin, Dilan, endosulfan, endrin, ethion, heptachlor, Methyl Trithion, Strobane, or tetradifon.

Do not graze livestock in cottonfields treated with trichlorfon within 14 days after application.

Do not graze livestock in cottonfields treated late in the season with azinphosmethyl, TDE, or toxaphene.

Do not feed gin waste from cotton treated with Aramite, azinphosmethyl, Bidrin, chlorbenzilate, demeton, diazinon, heptachlor, Methyl Trithion, Strobane, TDE, or toxaphene to livestock.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER GALLON UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
FLOWER GARDEN PLANTS (Also see Waterlily)							
Ants (Also see Imported fire ant)	Chlordane	--	--	6% D	--	On nests and infested areas and around infested plants.	
				40% WP	2 level tsp./3 gal. per 30 sq. ft.	Apply with sprinkling can to drench nests and infested soil. Soak soil around base of infested plants.	
	Mirex	--	--	Bait	--	Follow directions on the package label.	
Aphids (Also see Root aphid and Tulip bulb aphid)	Dimethoate	--	--	23.4% EC	2 tsp.	On foliage when aphids appear.	Do not apply dimethoate to chrysanthemum, Chinese holly, flowering almond, flowering plum, flowering peach, flowering cherry, cherry laurel, or to any plant not specified on the label.
	Endosulfan	--	--	2 lb./gal. EC	2 tsp.		
	Lindane	--	--	2% D 20% EC 25% WP	-- 1 tbsp. 1 level tbsp.		
	Malathion	--	--	4% D 57% EC	-- 2 tsp.		
Bagworm (Thyridopteryx ephemeraeformis)	Zectran	--	--	1.5 lb./gal. EC	2 tsp.	On infested foliage as needed.	
Beetles (For larvae, see Wireworms, white grubs, and other beetle grubs in soil)	Carbaryl	--	--	50% WP	2 level tbsp.	To foliage at weekly intervals. For adults of stem borers and stem girdlers dust weekly with DDT in June. (Cut and burn infested stems; destroy weed hosts.)	DDT may injure foliage of some varieties of azaleas, camellias, and gourds.
	DDT*	--	--	5% D 25% EC	-- 2 tsp.		
	Dimethoate	--	--	23.4% EC	2 tsp.		
	Malathion*	--	--	4% D 57% EC	-- 2 tsp.		
	Zectran	--	--	1.5 lb./gal. EC	2 tsp.		

*Not effective for some species.

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CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER GALLON UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
FLOWER GARDEN PLANTS (See also Waterlily)							
Borers in stems and roots (Also see Iris borer, Pickleworm, and Squash vine borer)	DDT*	--	--	5% D 25% EC	-- 2 tsp.	At weekly intervals to prevent infestation; apply also to nearby weeds; cut and burn infested stems.	DDT may injure foliage of some varieties of azaleas, camelias, and gourds.
	Zectran	--	--	1.5 lb./gal. EC	2 tsp.		
Caterpillars (Also see Red-banded leaf roller and Pickleworm)	DDT*	--	--	5% D 25% EC	-- 2 tsp.	To foliage at weekly intervals.	
	Malathion*	--	--	4% D 57% EC	-- 2 tsp.		
	Methoxychlor*	--	--	50% WP	2 level tbsp.		
	Zectran	--	--	1.5 lb./gal. EC	2 tsp.		
Cicada, periodical (Magicicada septendecim)	Carbaryl	--	--	50% WP	1 level tbsp.	On foliage when insects appear.	
Crickets, earwigs, and grasshoppers	Chlordane	--	--	6% D 45% EC	-- 2 tsp.	To infested plants and surrounding areas as insects appear.	Do not feed nearby vegetation treated with chlordane or DDT to poultry, dairy animals, or animals being finished for slaughter.
	DDT	--	--	5% D 25% EC	-- 1 tbsp.		
Earthworms	Chlordane	--	--	40% WP 45% EC	4 level tsp./3 gal. per 30 sq. ft. 2 tsp./3 gal./30 sq. ft.	Earthworms are beneficial. If they must be controlled, drench the soil around infested plants in pots.	

*Not effective for some species.

FLOWER AND ORNAMENTAL PLANT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER GALLON UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
FLOWER GARDEN PLANTS							
Fuller rose beetle (Pantomorus godmani)	Chlordane	--	--	6% D 40% WP	-- 4 level tsp.	On plants about July 1; repeat in 2 weeks.	Do not use lindane in soil to be planted within 2 years to peanuts or root crops intended for food, as it may adversely affect their flavor.
	Lindane	--	--	2% D 20% EC	-- 1 tsp.		
Garden symphylan (Scutigerella immaculata)	DDT	--	--	5% D	10 lb./1,000 sq. ft.	Mix thoroughly with soil before planting.	
	Lindane	--	--	2% D	5 lb./1,000 sq. ft.		
Greenhouse leaf tier (Udea rubigalis)	DDT	--	--	25% EC	1 tbsp.	On foliage as needed.	Do not apply dimethoate to chrysanthemum, Chinese holly, flowering almond, flowering plum, flowering peach, flowering cherry, cherry laurel, or to any plant not specified on the label.
	Dimethoate	--	--	23.4% EC	2 tsp.		
	Malathion	--	--	57% EC	2 tsp.		
	Zectran	--	--	1.5 lb./gal. EC	2 tsp.		
Hornets and cicada-killer (Sphecius speciosus)	Chlordane	--	--	6% D 40% WP	-- 4 level tsp.	These insects are seldom harmful to plants. If they must be controlled, apply dust in nest openings in July and August; dust or spray plants being girdled by hornets.	
Imported fire ant (Solenopsis saevissima richteri)	Chlordane	--	--	6% D 45% EC	1 - 2 cups/mound 4 tbsp./3 gal. per mound	Break open hard surface of mound and pour in the insecticide; sprinkle surrounding soil as for other ants. If ants survive, repeat in 2 weeks.	
	Mirex	--	--	Bait	--	Follow directions on the package label.	

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER GALLON UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
FLOWER GARDEN PLANTS							Do not apply dimethoate to chrysanthemum, Chinese holly, flowering almond, flowering plum, flowering peach, flowering cherry, cherry laurel, or to any plant not specified on the label.
Iris borer (Macronoctua onusta)	DDT	--	--	5% D 25% EC	-- 1 tbsp.	Weekly, beginning when plants start to grow in spring.	
	Dimethoate	--	--	23.4% EC	2 tsp.	To foliage when infestation begins; repeat in 2 weeks.	
Iris weevil (Mononychus vulpeculus)	DDT	--	--	5% D	--	To flowers if seed are being saved; otherwise, destroy flower heads when flowers fade.	
Japanese beetle (Popillia japonica)	Carbaryl	--	--	50% WP	2 level tbsp.	To foliage and flowers as needed.	
	Dimethoate	--	--	23.4% EC	2 tsp.		
	Malathion	--	--	4% D 57% EC	-- 2 tsp.		
Lacebugs	Lindane	--	--	2% D 20% EC	-- 2 tsp.	On azaleas May 15 and repeat at monthly intervals; on chrysanthemums, as infestation appears.	
	Malathion	--	--	4% D 57% EC	-- 2 tsp.		
Leafhoppers	DDT	--	--	5% D	--	At weekly intervals as infestation appears. (Protect asters and other flowers with astercloth shelter.)	
	Dimethoate	--	--	23.4% EC	2 tsp.		
	Malathion	--	--	4% D 57% EC	-- 2 tsp.		
Leaf miners	Dimethoate	--	--	23.4% EC	2 tsp.	Thorough coverage to kill larvae in mines.	
Continued	Lindane	--	--	20% EC	1 tbsp.		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER GALLON UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
FLOWER GARDEN PLANTS .							
Leaf miners (con.)	Malathion	--	--	57% EC	2 tsp.	Thorough coverage to kill larvae in mines.	
–	Zectran	--	--	1.5 lb./gal. EC	2 tsp.		
Leaf rollers	Dimethoate	--	--	23.4% EC	2 tsp.	On foliage as needed.	Do not apply dimethoate to chrysanthemum, Chinese holly, flowering almond, flowering plum, flowering peach, flowering cherry, cherry laurel, or to any plant not specified on the label.
	Zectran	--	--	1.5 lb./gal. EC	2 tsp.		
Mites Bulb mite (Rhizoglyphus echinopus)	Hot water	--	--	--	--	Immerse bulbs in hot water (111° F.) for 1 hour.	
Bulb scale mite (Steneotarsonemus laticeps)	Hot water	--	--	--	--	Soak infested amaryllis or narcissus bulbs in hot water (111° F.) for 30 minutes.	
Cyclamen mite (Steneotarsonemus pallidus)	Dicofol	--	--	18.5% EC	2 tsp.	On foliage at weekly intervals; clean up weed hosts.	
	Endosulfan	--	--	2 lb./gal. EC	2 tsp.		
False spider mite (Brevipalpus inornatus)	Dicofol	--	--	18.5% EC	1 tsp.	Weekly or as needed.	
Spider mites	Dicofol	--	--	18.5% EC	1 tsp.	Weekly or as needed; clean up overwintering weed and perennial hosts.	
	Dimethoate	--	--	23.4% EC	2 tsp.		
	Tetradifon	--	--	25% WP	1 level tbsp.		
Taxus bud scale mite (Cecidophyopsis psilaspis)	Endosulfan	--	--	2 lb./gal. EC	2 tsp.	On foliage in 3 weekly applications.	
Mole crickets (Scapteriscus spp.)	Chlordane	--	--	6% D	2 lb./1,000 sq. ft.	To hiding places and areas where plant damage occurs.	

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER GALLON UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
FLOWER GARDEN PLANTS							
Narcissus bulb fly (Merodon equestris)	Chlordane	--	--	6% D	1 lb. dust/ 75 ft. of row	On bulbs in planting furrow; to bases of plants in May.	
Pickleworm (Diaphania nitidalis)	Carbaryl	--	--	50% WP	2 level tbsp.	On plants at weekly intervals.	Do not apply dimethoate to chrysanthemum, Chinese holly, flowering almond, flowering plum, flowering peach, flowering cherry, cherry laurel, or to any plant not specified on the label.
	Dimethoate	--	--	23.4% EC	2 tsp.		
	Lindane	--	--	2% D 20% EC 25% WP	-- 1 tbsp. 1 level tbsp.		
	Zectran	--	--	1.5 lb./gal. EC	2 tsp.		
Plant bugs	DDT	--	--	5% D 25% EC	-- 1 tbsp.	At 7 - 10 day intervals when bugs appear.	
	Dimethoate	--	--	23.4% EC	2 tsp.		
	Malathion	--	--	4% D 57% EC	-- 2 tsp.		
Potato psyllid (Paratrioza cockerelli)	DDT	--	--	5% D	--	On foliage as needed.	
Red-banded leaf roller (Argyrotaenia velutinana)	Dimethoate	--	--	23.4% EC	2 tsp.	On foliage as needed.	
	Zectran	--	--	1.5 lb./gal. EC	2 tsp.		
Root aphid	Lindane	--	--	20% EC	1 tsp.	Pour 1 - 2 cups around base of infested plants.	Do not use lindane in soil to be planted within 2 years to peanuts or root crops intended for food as it may adversely affect their flavor.
Rose chafer (Macrodactylus subspinosus), rose curculio (Rhynchites bicolor); and rose slug (Endelomyia aethiops)	Carbaryl	--	--	50% WP	2 level tbsp.	On foliage, buds, and flowers as needed.	
	DDT	--	--	5% D 50% EC	-- 1 tbsp.		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER GALLON UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
FLOWER GARDEN PLANTS							
Rose midge (Dasineura rhodophaga)	DDT	--	--	50% WP	2 level tbsp.	At 10-day intervals to foliage and ground surface.	
Scales and mealybugs General	Dimethoate	--	--	23.4% EC	2 tsp.	As dormant spray on woody plants; as summer spray against crawlers and young scales.	Do not apply dimethoate to chrysanthemum, Chinese holly, flowering almond, flowering plum, flowering peach, flowering cherry, cherry laurel, or to any plant not specified on the label.
	Malathion	--	--	57% EC	2 tsp.		
	White oil emulsion	--	--	100% EC	5 tbsp.		
Peony scale (Pseudoanonidia paeoniae) and Florida wax scale (Ceroplastes floridensis)	White oil emulsion	--	--	100% EC	10 tbsp.		
Seed-corn maggot (Hylemya platura)	Chlordane	--	--	40% WP	4 level tsp.	In furrow after seed or corms are placed.	
Slugs and snails	Metaldehyde	--	--	10% D, G, liquids or pellets	Follow directions on container.	In infested areas; clean up hiding places.	
	Zectran	--	--	1.5 lb./gal. EC	2 tsp.		
Sowbugs and pillbugs	DDT	--	--	5% D	--		
Spittlebugs	Dimethoate	--	--	23.4% EC	2 tsp.	In early spring to kill hatching nymphs.	
	Lindane	--	--	2% D	--		
	Methoxychlor	--	--	4% D	--		
	Zectran	--	--	1.5 lb./gal. EC	2 tsp.		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER GALLON UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
FLOWER GARDEN PLANTS							
Springtails	Chlordane	--	--	45% EC	2 tsp.	On young infested seedlings.	
	Malathion	--	--	4% D 57% EC	-- 2 tsp.		
Squash vine borer (Melittia cucurbitae)	Carbaryl	--	--	50% WP	2 level tbsp.	On plants at weekly intervals.	
	Lindane	--	--	2% D 20% EC 25% WP	-- 1 tbsp. 1 level tbsp.		
	Zectran	--	--	1.5 lb./gal. EC	2 tsp.		
Termites	Chlordane	--	--	6% D	4 lb./1,000 sq. ft.	Work into soil in infested areas; clean up hiding places.	
Thrips	DDT	--	--	5% D	--	To stored gladiolus corms.	
	Dimethoate	--	--	23.4% EC	2 tsp.	On plants at weekly intervals.	Do not apply dimethoate to chrysanthemum, Chinese holly, flowering almond, flowering plum, flowering peach, flowering cherry, cherry laurel, or to any plant not specified on the label.
	Malathion	--	--	4% D	--		
Tulip bulb aphid (Dysaphis tulipae)	Lindane	--	--	2% D	--	To bulbs in storage.	
	Malathion	--	--	4% D 57% EC	-- 2 tsp.	On foliage when aphids appear.	
Weevils (Also see Iris weevil)	Chlordane	--	--	6% D	--	On foliage at 4- or 5-day intervals to protect flowers.	

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER GALLON UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
FLOWER GARDEN PLANTS							
Whiteflies Azalea whitefly (Pealius azaleae)	Malathion	--	--	57% EC	2 tsp.	Dormant spray; in summer spray as for whiteflies in greenhouse.	
	White oil emulsion	--	--	100% EC	5 tbsp.		
Greenhouse whitefly (Trialeurodes vaporariorum)	Dimethoate	--	--	23.4% EC	2 tsp.	4 weekly applications on summer foliage.	Do not apply dimethoate to chrysanthemum, Chinese holly, flowering almond, flowering plum, flowering peach, flowering cherry, cherry laurel, or to any plant not specified on the label.
	Endosulfan	--	--	2 lb./gal. EC	2 tsp.		
	Lindane	--	--	2% D 20% EC	-- 1 tbsp.		
	Malathion	--	--	4% D 57% EC	-- 2 tsp.		
Wireworms, white grubs, and other beetle grubs in soil	Chlordane	--	--	40% WP	5 oz./1,000 sq. ft.	Work into soil before planting. To protect gladiolus, apply 6% chlordane dust to corms in planting furrow.	
	DDT	--	--	50% WP	0.5 lb./1,000 sq. ft.		
HOUSE PLANTS AND HOME GREENHOUSE PLANTS							
Ants	Chlordane	--	--	45% EC 40% WP	2/3 tsp. 1½ level tsp.	Spray plants. Soak pots, boxes, or shelves. Drench walks or soil at rate of 1 gal./10 sq. ft.	Move plants outdoors to treat if practicable.
Aphids	Lindane	--	--	20% EC 25% WP	1 tsp. 1 level tbsp.	Dip or spray plants.	
	Malathion	--	--	57% EC	2 tsp.		

FLOWER AND ORNAMENTAL PLANT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER GALLON UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
HOUSE PLANTS AND HOME GREENHOUSE PLANTS							
Cutworms and other caterpillars	DDT	--	--	25% EC 50% WP	1 tbsp. 2 level tbsp.	For cutworms that hide in soil, spray or drench soil. Dip or spray plants. (Hand picking may suffice.)	Move plants outdoors to treat if practicable.
	Malathion	--	--	57% EC	2 tsp.		
	Rotenone	--	--	5% EC 4 - 5% WP	4 tsp. 4 level tbsp.	Dip or spray plants. (Hand picking may suffice.)	
Cyclamen mite (Steneotarsonemus pallidus)	Dicofol	--	--	18.5% EC	1 tsp. Add ½ tsp. mild detergent.	Dip or spray plants weekly until new growth is normal.	
	Hot water	--	--	--	--	Immerse plants 15 minutes in water held at 110° F.	
Earthworms	Chlordane	--	--	45% EC 40% WP	2/3 tsp. 1½ level tsp.	Soak soil in pots, boxes, or planters. Drench other soil at rate of 1 gal. per 10 sq. ft.	
False spider mite (Brevipalpus inornatus)	Dicofol	--	--	18.5% EC 18.5% WP	1 tsp. 1 level tbsp. Add ½ tsp. mild detergent to either formulation.	Dip or spray plants.	
Fungus gnats	Chlordane	--	--	45% EC 40% WP	2/3 tsp. 1½ level tsp.	Soak soil in pots, boxes, or planters. Drench soil at rate of 1 gal./10 sq. ft.	
	DDT	--	--	25% EC 50% WP	1 tbsp. 2 level tbsp.		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER GALLON UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
HOUSE PLANTS AND HOME GREENHOUSE PLANTS							
Mealybugs	Malathion	--	--	57% EC	2 tsp. Add ½ tsp. mild detergent.	Dip or spray plants.	Move plants outdoors to treat if practicable.
Millipedes	DDT	--	--	25% EC 50% WP	1 tbsp. 2 level tbsp.	Drench soil and hiding places of pest.	
Psocids	Chlordane	--	--	45% EC 40% WP	2 tsp. 4 level tsp.	Spray soil, pots, saucers, or shelves.	
Scales	Malathion	--	--	57% EC	2 tsp. Add ½ tsp. mild detergent.	Dip or spray plants at 3- to 4- week intervals.	
Slugs and snails	Metaldehyde	--	--	B	As directed on container label.		
Sowbugs and pillbugs	DDT	--	--	25% EC 50% WP	1 tbsp. 2 level tbsp.	Spray soil and hiding places of pests.	
Spider mites	Dicofol	--	--	18.5% EC 18.5% WP	1 tsp. 1 level tbsp.	Dip or spray plants weekly or as needed.	
	Malathion	--	--	57% EC	2 tsp.		
Springtails	Chlordane	--	--	45% EC 40% WP	2 tsp. 4 level tsp.	Spray soil, pots, saucers, or shelves.	
	Malathion	--	--	57% EC	2 tsp.		
Thrips	DDT	--	--	25% EC 50% WP	1 tbsp. 2 level tbsp.	Dip or spray plants.	
	Malathion	--	--	57% EC	2 tsp.		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER GALLON UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
HOUSE PLANTS AND HOME GREENHOUSE PLANTS							
Whiteflies	Lindane	--	--	25% EC 25% WP	1 tsp. 1 level tbsp.	Dip or spray plants weekly or as needed.	Move plants outdoors to treat if practicable.
	Malathion	--	--	57% EC	2 tsp.		
	Rotenone	--	--	5% EC 4 - 5% WP	4 tsp. 4 level tbsp.		
WATERLILY							
Aphids, beetles, and leaf cutters	Malathion	--	--	4% D 57% EC	-- 2 tsp.	To flowers and foliage.	Remove fish from pool before applying insecticide; change water before returning fish.

The recommendations for fruit insects are general and may need to be modified to apply to particular regions of the country. Consult your State Agricultural Experiment Station for recommendations applicable to your conditions.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Aphids, including woolly apple aphid (Eriosoma lanigerum)	Dinitrocresol	0	--	WP	0.5	3	Dormant.	Do not use azinphosmethyl, demeton, parathion, or tepp in small home plantings; should be applied only by a trained operator. Do not make more than 3 applications of demeton. Do not apply endosulfan more than twice during fruiting period. Do not use parathion on McIntosh or related varieties. Do not feed pomace from apples sprayed with endosulfan to livestock. Do not use benezene hexachloride after fruit starts to form or lindane after first cover spray. Later applications may impart off-flavor to fruit. Remove excess residues of lead arsenate at harvest. Lead arsenate should be mixed with an equal amount of hydrated lime or other safener.
	Benezene hexachloride	5	60	WP	0.25 (gamma)	2	Prepink or pink, or when aphids appear. Do not wait until leaves curl.	
	Demeton	0.75	21	EC	0.19	1.5		
	Diazinon	0.75	14	WP	0.25	2		
	Endosulfan	2	30	WP	0.5	4		
	Lindane	10	60	WP	0.25	2		
	Malathion	8	3	WP	0.5	4		
	Parathion	1	14	WP	0.25	2		
	Tepp	0	3	EC	0.12	1		
Apple-and-thorn skeletonizer (Anthophila pariana)	DDT	7	30*	WP	1	10	Once or twice early in spring when caterpillars appear.	
	Lead arsenate	7 (combined lead)	40	WP	2	20		
Apple maggot (Rhagoletis pomonella)	Azinphosmethyl	2	15	WP	0.3	3	3 - 5 times as needed, every 10 days beginning when flies appear.	
	Azinphosmethyl + Carbaryl	2 + 10	15	WP + WP	0.25 + 0.25	2.5 + 2.5		
Continued	Methoxychlor	14	7	WP	1	10		

*40 days if used in more than 5 applications in complete schedule; if further spraying is needed, use other than a chlorinated hydrocarbon.

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Apple maggot (Rhagoletis pomonella) (con.)	DDT	7	30*	WP	1	10	3 - 4 times 10 days apart after flies appear.	Do not use parathion in small home plantings; should be applied only by a trained operator.
	Diazinon	0.75	14	WP	0.5	5	Late applications when other materials might leave excessive residues.	Do not use parathion on McIntosh or related varieties.
	Lead arsenate	7 (combined lead)	40	WP	3	30	2 - 3 times 10 - 14 days apart after flies appear.	Remove excess residues of lead arsenate at harvest.
Apple red bug (Lygidea mendax)	DDT	7	30*	WP	1	10	Petal fall.	Lead arsenate should be mixed with an equal amount of hydrated lime or other safener.
	Parathion	1	14	WP	0.3	3		
Bagworm (Thyridopteryx ephemeraeformis)	Carbaryl	10	1	WP	1	10	May or June when young bagworms appear.	Do not use carbaryl before 4 weeks after petal fall, unless used for thinning purposes.
	Chlordane	0.3	30	WP	0.8	8		
	Lead arsenate	7 (combined lead)	40	WP	3	30		
	Malathion	8	3	WP	0.75	7.5		
	Parathion	1	14	WP	0.3	3		
Borer, roundheaded apple tree (Saperda candida)	DDT	7	30*	WP	1	10	On trunks and foliage 3 weeks after petal fall and 2 - 3 weeks later.	
	Lead arsenate	7 (combined lead)	40	WP	3	30		

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CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Borer, shot-hole (Scolytus rugulosus)	DDT	7	30*	WP	1	10	When adults are active in May and September or after crop is harvested.	Do not use azinphosmethyl or parathion in small home plantings; should be applied only by a trained operator.
	Parathion	1	14	WP	0.3	3		
Cankerworms, fall (Alsophila pometaria) and spring (Paleacrita vernata)	Carbaryl	10	1	WP	1	8	Pink.	Do not use parathion on McIntosh or related varieties.
	DDT	7	30*	WP	0.5	4		
	Lead arsenate	7 (combined lead)	40	WP	3	24		Do not use carbaryl before 4 weeks after petal fall unless used for thinning purposes.
Casebearers (Coleophora spp.)	DDT	7	30*	WP	1	10	Pink and first cover spray.	Lead arsenate should be mixed with an equal amount of hydrated lime or other safener; remove excess residues at harvest.
Codling moth (Carpocapsa pomonella) Pacific Northwest	Azinphosmethyl	2	15	WP	0.37	3.75	2 - 4 cover sprays, 3 weeks after petal fall and at 3-week intervals, as needed.	
	Carbaryl	10	1	WP	0.75	7.5		
	Diazinon	0.75	14	WP	0.5	5		
Other areas	Azinphosmethyl	2	15	WP	0.37	3.75	For first brood 3 - 4 times 10 - 14 days apart, beginning about 10 - 14 days after petal fall; for second and third broods 1 - 3 times at similar intervals.	
	Azinphosmethyl + Carbaryl	2 + 10	15	WP + WP	0.12 + 0.25	1.25 + 2.5		
	Carbaryl	10	1	WP	0.5	5		
	DDT	7	30*	WP	1	10	Use azinphosmethyl or carbaryl to control DDT-resistant strains.	
	Lead arsenate**	7 (combined lead)	40	WP	3	30		

Continued

*40 days if used in more than 5 applications in complete schedule; if further spraying is needed, use other than a chlorinated hydrocarbon.

**Use only to control light infestations or where it has been satisfactory.

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Codling moth (Carpocapsa pomonella) Other areas (con.)	Methoxychlor (home orchard only)	14	7	WP	1.5	15	For first brood 3 - 4 times 10 - 14 days apart, beginning about 10 - 14 days after petal fall; for second and third broods 1 - 3 times at similar intervals.	Do not use azinphosmethyl or parathion in small home plantings; should be applied only by a trained operator. Do not use parathion on McIntosh or related varieties.
	Parathion	1	14	WP	0.25	2.5		
Climbing cutworms	DDT	7	30*	WP	1	2	On trunk and about base of tree when opening buds are attacked.	
Eye-spotted bud moth (Spilonota ocellana)	Azinphosmethyl	2	15	WP	0.25	2.5	Delayed dormant to first cover and midsummer.	
	Malathion	8	3	WP	0.5	5		
	Parathion	1	14	WP	0.25	2.5		
Fall webworm (Hyphantria cunea)	Azinphosmethyl	2	15	WP	0.25	2.5	Midsummer, when webs are first noticed.	
	DDT	7	30*	WP	1	10		
	Lead arsenate	7 (combined lead)	40	WP	2	20		Lead arsenate should be mixed with an equal amount of hydrated lime or other safener; remove excess residues at harvest.
	Parathion	1	14	WP	0.3	3		
Fruitworms	Azinphosmethyl	2	15	WP	0.25	2.5	Petal fall or first cover.	
	DDT	7	30*	WP	1	10		
	Lead arsenate	7 (combined lead)	40	WP	3	30		

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FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Grasshoppers	Carbaryl	10	1	WP	--	1	Spray ground cover and fence rows when hoppers become numerous.	Do not use azinphosmethyl or parathion in small home plantings; should be applied only by a trained operator. Do not use parathion on McIntosh or related varieties. Malathion EC may injure these varieties if used within 4 weeks of harvest. Do not use carbaryl before 4 weeks after petal fall, unless used for thinning purposes.
	Malathion	8	3	EC	--	1		
Japanese beetle (Popillia japonica)	Carbaryl	10	1	WP	1	10	When beetles appear; repeat in 10 - 14 days if needed.	
	DDT	7	30*	WP D	1 --	10 10		
	Methoxychlor	14	7	WP	1.5	15		
	Malathion	8	3	WP	0.5	5	When beetles appear; repeat every 7 - 10 days as needed.	
	Parathion	1	14	WP	0.3	3		
	Rotenone	Exempt	1	Powder	0.12	1.25		
Leafhoppers	Azinphosmethyl	2	15	WP	0.25	2.5	Once or twice when leafhoppers appear.	
	DDT	7	30*	WP	0.5	5		
	Malathion	8	3	WP	0.5	5		
	Parathion	1	14	WP	0.15	1.5		
Leaf roller, fruit-tree (Archips argyrospilus)	Mineral oil (Superior)	Exempt	--	EC	3 gallons	18 gallons	Dormant.	
	Azinphosmethyl	2	15	WP	0.25	2.5	When buds begin to separate or petal fall.	
	DDT	7	30*	WP	1	10		

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CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Leaf roller, red-banded (Argyrotaenia velutinana)	Azinphosmethyl + Carbaryl	2 + 10	15	WP + WP	0.12 + 0.25	1.25 + 2.5	Fifth and sixth cover.	Do not use azinphosmethyl, demeton, or parathion in small home plantings; should be applied only by a trained operator.
	Carbaryl	10	1	WP	1	10		
	Azinphosmethyl	2	15	WP	0.37	3.75	Petal fall and first cover and fifth or sixth cover.	Do not use carbaryl before 4 weeks after petal fall unless used for thinning purposes.
	Parathion	1	14	WP	0.3	3		Do not use parathion on McIntosh or related varieties.
	Lead arsenate	7 (combined lead)	40	WP	3	30	Petal fall and first cover.	Lead arsenate should be mixed with an equal amount of hydrated lime or other safener; remove excess residues at harvest.
	TDE	7	30	WP	1	10	Petal fall and fifth or sixth cover.	
Mites, apple rust (Aculus schlechtendali)	Carbaryl	10	1	WP	1	10	Once when mites appear.	Do not use binapacryl with oil or EC and do not apply more than 4 times per season.
	Dicofol	5	7	EC or WP	0.37	3.75		
Mites, brown (Bryobia rubrioculus) and European red (Panonychus ulmi)	Aramite	0	--	WP	0.25	2.5	Cover sprays as needed on trees with no fruit.	After petal fall do not make more than 3 applications of tetradifon at 2.5 lb. per acre or more than 4 applications at 1.25 lb. per acre to trees with fruit.
	Binapacryl	--	60	WP	0.19	2	Petal fall or first cover, if prebloom control omitted; in later covers as needed.	Do not feed pomace from tetradifon-treated apples to livestock.
	Tetradifon	5	1	WP	0.12 - 0.25	1.25 - 2.5		
	Demeton	0.75	21	EC	0.19	2	Pink, petal fall.	Do not make more than 3 applications of demeton.

Continued

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Mites, brown (Bryobia rubrioculus) and European red (Panonychus ulmi) (con.)	Dicofol	5	7	EC or WP	0.37	3.75	2 cover sprays 7 - 10 days apart except, in West, in first or second and in third cover sprays.	Do not use demeton or tepp in small home plantings; should be applied only by a trained operator.
	Mineral oil (Superior)	Exempt	--	EC	2 gallons	12 gallons	Delayed dormant.	Do not make more than 3 applications of demeton.
	Mineral oil (Other)	Exempt	--	EC	3 gallons	18 gallons		Do not use demeton if phosphorus-resistant strains are present.
	Morestan	--	--	WP	0.25	2	Prepink or pink.	Do not apply Morestan after edible parts begin to form ; can be used on trees without a crop.
	Tepp	0	3	EC	0.12	1.25	2 cover sprays, 7 days apart.	
Mite, pear leaf blister (Eriophyes pyri) All areas	Demeton	0.75	21	EC	0.19	2	In spring or summer when dormant spray was omitted or ineffective.	Do not use tepp with lime.
	Diazinon	0.75	14	WP	0.5	5	In early fall after fruit is harvested.	
	Lime sulfur	Safe	--	Liquid	2.5	25 15 on dormant trees.	In fall when mites are migrating from leaves to buds or late in dormant season just as buds are swelling.	
Continued	Mineral oil	Exempt	--	EC	3 gallon	18 gallons	As buds are swelling.	

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Mites, pear leaf blister (Eriophyes pyri) (con.) Pacific Northwest	Lime sulfur + Mineral oil	Safe + Exempt	--	Liquid + EC	2 gallons + 3 gallons	12 gallons + 18 gallons	As buds are swelling.	Do not use azinphosmethyl or tepp in small home plantings; should be applied only by a trained operator.
	Lime sulfur + Wettable sulfur	Safe	--	Liquid + powder	4 gallons + 2 pounds	40 gallons + 20 pounds	In early fall after fruit is harvested.	
Mites, spider (Tetranychus spp.)	Aramite	0	--	WP	0.25	2.5	Cover sprays as needed on trees with no fruit.	
	Binapacryl	--	60	WP	0.19	2	2 cover sprays 7 - 10 days apart except, in West, in first or second and in third cover sprays.	Do not use binapacryl with oil or EC and do not apply more than 4 times during a season.
	Dicofol	5	7	EC or WP	0.37	3.75		
	Tepp	0	3	EC	0.12	1.25	2 - 3 cover sprays 7 days apart.	Do not use tepp with lime.
	Tetradifon	5	1	WP	0.25	2.5	When infestation starts.	After petal fall do not make more than 3 applications of tetradifon at 2.5 lb. per acre to trees with fruit.
Periodical cicadas (Magicicada spp.)	Carbaryl	10	1	WP	1	10	Late May or early June when adults start emerging; repeat every 3 - 5 days as needed. Apply early in morning before cicadas become active.	Do not feed pomace from tetradifon-treated apples to livestock.
	Tepp	0	3	EC	0.12	1.25		Do not use carbaryl before 4 weeks after petal fall unless used for thinning purposes.
Plum curculio (Conotrachelus nenuphar)	Azinphosmethyl	2	15	WP	0.37	3.75	Petal fall and once or twice more 7 - 10 days apart.	
	Lead arsenate	7 (combined lead)	40	WP	3	30		Lead arsenate should be mixed with an equal amount of hydrated lime or other safener; remove excess residues at harvest.
	Methoxychlor	14	7	WP	1.5	15		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Scales, Forbes (Aspidiotus forbesi), Putnam (A. ancylus), San Jose (A. perniciosus) All areas	Azinphosmethyl	2	15	WP	0.5	5	When crawlers are present; about second, sixth, and seventh covers.	Do not use azinphosmethyl or parathion in small home plantings; should be applied only by a trained operator. Do not use parathion on McIntosh or related varieties.
	Malathion (home orchards only)	8	3	WP	0.5	5		
	Parathion	1	14	WP	0.25	2.5		
	Mineral oil (Superior)	Exempt	--	EC	2 gallons	12 gallons	Dormant or delayed dormant.	
Pacific Northwest	Mineral oil + Lime sulfur	Exempt + Safe	--	EC + liquid	2 gallons + 3 gallons	12 gallons + 18 gallons		
	Parathion	1	14	WP	0.25	2	Prepink.	
Scales, oystershell (Lepidosaphes ulmi) and scurfy (Chionaspis furfura)	DDT	7	30*	WP	1	10	When eggs hatch, usually petal fall and first cover.	
	Parathion	1	14	WP	0.3	3		
Tent caterpillars Eastern (Malacosoma americanum)	DDT	7	30*	WP	1	10	When caterpillars appear early in spring.	Lead arsenate should be mixed with an equal amount of hydrated lime or other safener; remove excess residues at harvest.
	Lead arsenate	7 (combined lead)	40	WP	3	30		
	Malathion	8	3	WP	0.75	7.5		
	Methoxychlor	14	7	WP	1	10		
Western (M. pluviale)	DDT	7	30*	WP	1	8	Just before bloom.	

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FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
APPLE								
Treehoppers Buffalo (Stictocephala bubalus)	DDT	7	30*	WP	0.5	5	June and July cover sprays; spray ground cover as well as trees.	Do not use azinphosmethyl, demeton, parathion, or phosphamidon in small home plantings; should be applied only by a trained operator.
General species	Mineral oil	Exempt	--	EC	4 gallons	24 gallons	Dormant.	
Unspotted and spotted tentiform leaf miners (Lithocolletis spp.)	Azinphosmethyl	2	15	WP	0.25	2.5	When leaf miners first appear. If heavy carryover is present, start at pink bud period.	
	Demeton	0.75	21	EC	0.19	2		Do not make more than 3 applications of demeton.
	Malathion	8	3	WP	0.5	5		
	Parathion	1	14	WP	0.25	2.5		Do not use parathion on McIntosh or related varieties.
	Phosphamidon	--	60	EC	0.25	2.5		
Yellow-necked (Datana ministra) and red-humped (Schizura concinna) caterpillars	Malathion	8	3	WP	0.5	5	When young appear, usually July and August.	
	Parathion	1	14	WP	0.25	2.5		

APRICOT (See Peach and Apricot)

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CROP AND INSECTICIDE	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CHERRY								
Black cherry aphid (Myzus cerasi)	Dinitrobutylphenol	--	--	EC	0.75	3.75	Dormant.	Do not use azinphosmethyl, demeton, parathion or tepp in small home plantings; should be applied only by a trained operator. Do not apply endosulfan more than twice after shucks split.
	Dinitrocresol	--	--	WP	0.62	3.12		
	Diazinon	0.75	10	EC	0.5	4	When aphids appear, about time buds are breaking, and 10 - 14 days later, or in summer.	
	Endosulfan	2	21	WP	0.3	2.5		
	Malathion (home orchards only)	8	3	EC	0.5	4		
	Parathion	1	14	EC or WP	0.25	2		
	Tepp	0	3	EC	0.12	1		
	Demeton	--	--	EC	0.25	1.5	Prebloom or petal fall stages.	Do not apply demeton to cherries after petal fall or more than once per season. Do not make more than 8 applications of azinphosmethyl per season.
Borer, lesser peach tree (Synanthedon pictipes)	Azinphosmethyl	2	15	WP	0.5	1	To trunks and scaffold limbs 4 times at 3-week intervals, beginning with emergence in June. In Georgia twice for first brood (April and May) and again for second brood (August and September).	
	Endosulfan	2	21	WP	0.75	1.5		
	Malathion	8	3	WP	1	2		
Borer, peach tree (Sanninoidea exitiosa)	Azinphosmethyl	2	15	WP	0.5	1	In latitude of Virginia and northward, 2 times to trunks (July 1 - 15 and 3 - 4 weeks later); southward, 3 times (July 10 - 15 and after 3 - 4 week intervals); in south Georgia 4 times at 4-week intervals beginning August 1.	
	Endosulfan	2	21	WP	0.75	1.5		
	Parathion	1	14	WP	0.25	0.5		

Continued

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CHERRY								
Borer, peach tree (Sanninoidea exitiosa) (con.)	Ethylene dichloride	--	--	7.5% emulsion	--	0.12 pint per tree for trees under 4 years old.	To ground in ring around trunk in fall or first warm spell in spring.	Do not use parathion in small home plantings; should be applied only by a trained operator. Do not pour or spray ethylene dichloride onto trunk.
				20% emulsion	--	0.5 pint per tree for trees over 4 years old.		
	Paradichloro-benzene	--	--	Crystals	--	0.25 - 1.5 ounces per tree.	To ground in ring around trunk in late August or early September in North to late October in South.	Keep paradichlorobenzene crystals from touching tree.
Borer, shot-hole (Scolytus rugulosus)	DDT	7	30	WP	1	8	When adults are active in May and September.	
	Parathion	1	14	WP	0.25	2		
Cherry fruitworm (Grapholitha packardi)	Methoxychlor	14	7	WP	1	8	4 weeks after petal fall.	
Fruit flies, cherry (Rhagoletis cingulata) and black cherry (R. fausta)	Methoxychlor	14	7	EC or WP	1	8	When first flies are trapped, 2 - 3 times 10 days apart; for diazinon, 2-4 times 7 days apart.	For materials with choice of EC or WP use EC in applications close to harvest.
	Perthane	15	2	EC D	1 --	8 5		
	Parathion	1	14	EC or WP D	0.25 --	2 1		
	Diazinon	0.75	10	EC	0.5	4		

Continued

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CHERRY								
Fruit flies, cherry (Rhagoletis cingulata) and black cherry (R. fausta) (con.)	Rotenone	Exempt	1	Powder D	0.12 --	1 0.3	When first flies are trapped, 2 - 4 times 7 - 10 days apart.	Do not use azinphosmethyl, carbophenothion, or parathion in small home plantings; should be applied only by a trained operator.
Japanese beetle (Popillia japonica)	Carbaryl	10	1	WP	0.75	6	When beetles appear; repeat at 10 - 14 day intervals as needed.	
	DDT	7	30	EC or WP	1	8		For materials with choice of EC or WP use EC in applications close to harvest.
	Methoxychlor	14	7	EC or WP	1.5	12		
	Malathion	8	3	EC	0.5	4	When beetles appear; repeat at 7 - 10 day intervals as needed.	
	Parathion	1	14	WP	0.25	2		
	Rotenone	Exempt	1	Powder	0.12	1		
Mites, European red (Panonychus ulmi), two-spotted spider (Tetranychus urticae), and McDaniel (T. mcdanieli)	Azinphosmethyl	2	15	WP	0.5	4	2 times 7 - 10 days apart as needed.	After shuck-split limit use of tetradifon to 2 applications at 1 lb. per acre or 1 application at 2 lb. per acre.
	Carbophenothion	0.8	30	WP	0.25	2		
	Parathion	1	14	WP	0.25	2		
	Tetradifon	5	1	WP	2 - 4	1 - 2		
	Dicofol	5	7	WP	0.37	3	As needed.	Do not repeat use of dicofol within 30 days.
Mites, plum rust (Aculus fockeui)	Dicofol	5	7	WP	0.37	3	When mites first appear; repeat if necessary.	
	Sulfur	Safe	--	WP	3	24		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CHERRY								Do not use azinphosmethyl, EPN, parathion or tepp in small home plantings; should be applied only by a trained operator. For materials with choice of EC or WP use EC in applications close to harvest. Lead arsenate should be mixed with an equal amount of hydrated lime or other safener.
Pandemis moth (Pandemis albaniana)	DDT	7	30	WP	1	8	Just before bloom.	
	Parathion	1	14	EC or WP	0.25	2	7-10 days after petal fall.	
Pear slug (Caliroa cerasi)	DDT	7	30	WP	1	8	15 - 20 days after bloom or later when slugs appear.	
	Lead arsenate	7 (combined lead)	30*	Powder	2**	16		
	Parathion	1	14	WP	0.25	2		
Pear thrips (Taeniothrips inconsequens)	DDT	7	30	WP	1	8	When buds show green and if needed when they show white and just after bloom.	
Periodical cicadas (Magicicada spp.)	Carbaryl	10	3	WP	0.75	6	Late May or early June when adults start emerging, early in morning before they become active; repeat every 3 - 5 days as needed.	
	Tepp	0	3	EC	0.19	1.5		
Plum curculio (Conotrachelus nenuphar)	Azinphosmethyl	2	15	WP	0.5	4	2 - 3 times 8 - 10 days apart, beginning at petal fall or shuck split.	
	EPN	3	21	WP	0.37	3		
	Methoxychlor	14	7	WP	1.5	12		
	Parathion	1	14	WP	0.25	2		

*14 days fruit for processing.
**1 pound on English Morello variety.

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CHERRY								
Rose chafer (Macrodactylus subspinosus)	Carbaryl	10	1	WP	0.75	6	When present.	Do not apply parathion in small home plantings; should be applied only by a trained operator.
	Methoxychlor	14	7	WP	1	8		
	Parathion	1	14	WP	0.25	2		
Scales, San Jose (Aspidiotus perniciosus) and Forbes (A. forbesi) Pacific Northwest	Diazinon	0.75	10	WP	0.5	4	10 days before harvest.	
	Parathion	1	14	WP	0.25	2	Prebloom.	
All areas	Mineral oil (Superior)	Exempt	--	EC	2 gallons	10 gallons	Dormant.	
	Mineral oil (Other)	Exempt	--	EC	3 gallons	15 gallons		
	Carbaryl	10	1	WP	0.5	4	3 weeks before and immediately after harvest.	
	Malathion (home orchard only)	8	3	EC	0.62	5		
	Parathion	1	14	WP	0.25	2		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CITRUS								
Aphids California and Arizona	Rotenone extract	Exempt	1	EC (2-3% rotenone)	0.02-0.03	0.2-0.3	As needed.	Do not use demeton, mevinphos, or tepp in small home plantings; should be applied only by a trained operator.
	Petroleum oil + rotenone*	Exempt	1	EC + EC or WP	0.5-1 gal. +0.02-0.03	5-10 gal. + 0.2-0.3		
	Demeton	0.75	21	EC	0.12	1.25	Outside coverage as needed with conventional sprayer.	Limit demeton application to oranges, lemons, and grapefruit.
				EC	--	1	Mist spray as needed with concentrate sprayer.	Do not apply malathion, mevinphos, or tepp during bloom.
	Malathion	8	7	EC or WP	0.37	3.75	Outside coverage with conventional sprayer as needed.	Do not use malathion on citrus citron.
				EC or WP	--	2.5-3	With mist blower as needed.	
	Mevinphos	0.25	1	EC	0.06	0.6	Outside coverage as needed with conventional sprayer.	Limit mevinphos application to oranges, lemons, and grapefruit. Do not repeat application within 7 days.
				EC	--	0.5	With mist blower as needed.	
	Tepp	0	3	Soln.	0.2	2	As needed.	
Citrus thrips (Scirtothrips citri) California and Arizona	Sulfur	Safe	0	D	--	100	3 applications: First, pre-bloom in February or March; second, at petal fall; third, 2-4 weeks later.	Do not use sulfur near picking time or when temperatures of 100° F. or higher are expected within a week. Do not apply within 2 months of an oil spray.

Continued

*Prepare and use mixtures according to manufacturer's directions.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CITRUS								
Citrus thrips (Scirtothrips citri) California and Arizona (con.)	DDT 2% + sulfur at least 85%	7 + Safe	30	D	--	100	At petal fall. Second application in 2 - 4 weeks if necessary.	Do not use parathion in small home plantings; should be applied only by a trained operator.
	Tartar emetic*	3.5	30	Soln. + sugar	--	1.5 - 2.5 + 1.5 - 2.5	With mist blower at petal fall and in summer. Apply higher dosage in summer.	Do not apply more than 2.5 lb. tartar emetic per acre per application.
	DDT*	7	30	WP	--	2 - 4	Apply with mist blower. Use higher dosage in desert regions.	Do not apply dioxathion more than twice a year to lemons and limes and allow at least 4 months between applications. On oranges, grapefruit, tangelos, and tangerines, make applications at least 3 months apart if fruit is present during first application.
	Dieldrin*	0.25	30	EC or WP	--	0.5	With mist blower or aircraft at petal fall or in summer.	
	Dioxathion	2.8	0	EC	--	2	With mist blower at petal fall.	
	Parathion	1	14	EC or WP	--	1.5	With mist blower or aircraft at petal fall. Only as emergency treatment in California.	Do not use dieldrin on citrus citron, or dioxathion on citrus citron or kumquats.
	Sabadilla	Exempt	0	Liquid extract + sugar	--	0.04 (alkaloid) + 10	With mist blower at petal fall and in summer.	Use oil only as emergency treatment on navel oranges.
Mite, citrus red (Panonychus citri) California	Mineral oil, light medium or medium	Exempt	0	EC	1.75	55 gal.	On oranges and grapefruit: medium oil in August and September; light medium in September and October. On lemons: medium oil in April and May; and/or September - December.	Do not apply DN-111 during or just preceding high temperatures.
	Ovex*	5	15	WP	0.37	5.5	Thorough coverage with conventional sprayer as mites appear.	Do not use ovex on citrus citron, kumquats, limes, or tangelos.

Continued

*Not effective in some areas. With ovex, add DN-111, 3/5 lb. per acre, or chlorobenzilate, 1.5 lb. per acre, if many adult mites are present.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CITRUS								Do not use carbophenothion in small home plantings; should be applied only by a trained operator. Do not apply tetradifon more than once per season while fruit is present. Do not use dioxathion or ethion on citrus citron or kumquats; or tetradifon on kumquats. Do not apply DN-111 during or just preceding high temperatures. Do not use dicofol in highly alkaline sprays. Do not apply dioxathion more than twice a year to lemons and limes and allow at least 4 months between applications. On oranges, grapefruit, tangelos, and tangerines, make applications at least 3 months apart if fruit is present during first application. Limit use of ethion to one application on lemons and limes and to two applications per crop on tangerines. Do not repeat application within 90 days on grapefruit, oranges, tangelos, and tangerines.
Mite, citrus red (Panonychus citri) California (con.)	Ovex* (con.)	5	15	WP	--	4	With mist blower as mites appear.	
	Tetradifon*	2	0	WP	0.25	3.75	Thorough coverage with conventional sprayer as mites appear.	
				WP	--	2.5	With mist blower as mites appear.	
	DN-111	1	15	WP	0.2	2	Thorough coverage with conventional sprayer as mites appear.	
	Dicofol*	10	7	EC	0.37	5.5		
				EC	--	3	With mist blower as mites appear.	
	Dioxathion*	2.8	0	EC	0.37	5.5	Thorough coverage with conventional sprayer as mites appear.	
				EC	--	4	With mist blower as mites appear.	
	Carbophenothion*	2	30	WP	0.37	5.5	Thorough coverage with conventional sprayer as mites appear.	
Mites, citrus red (Panonychus citri), Texas citrus (Eutetranychus banksi), and six spotted (Eotetranychus sexmaculata) Florida	Carbophenothion	2	14	EC or WP	0.25-0.37	2.5 - 3.75	Post bloom, late spring, fall, winter. Preferred use is in late fall and winter for combined control of rust mite and spider mites.	
	Dioxathion	2.8	0	EC	0.25	2.5	Fall, winter.	
	Ethion	2	21**	EC or WP	0.25	2.5		
	Dicofol	10	7	EC	0.25 - 0.37	2.5 - 3.75	Late spring, fall, winter.	

Continued

*Not effective in some areas. To ovex and tetradifon, add DN-111, 3/5 lb. per acre, or chlorobenzilate, 1.5 lb. per acre, if many adults are present.
Do not use ovex on citrus citron, kumquats, limes, or tangelos.
**No time limit on grapefruit, oranges, tangelos, and tangerines.

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CITRUS								
Mites, citrus red (Panonychus citri), Texas citrus (Eutetranychus banksi) and six-spotted (Eotetranychus sexmaculata) Florida (con.)	Tetradifon	2	0	WP	0.12	1.25	Fall.	Do not use carbophenothion in home plantings; should be applied only by a trained operator. Do not apply tetradifon more than once per season when fruit is present, do not apply on kumquats.
	Oil	Exempt	0	Emulsion	0.7 gal.	7 gal.	Post bloom, June 1 - July 15.	
Mites, Texas citrus (Eutetranychus banksi) and false spider (Brevipalpus spp.) Texas	Dicofol	10	7	EC	0.25	2.5	Post bloom and fall.	Do not apply oil to trees near wilting, to drought-stricken trees, or to fruit less than 3 in. in diameter. Allow 4 weeks between oil sprays and sulfur. Do not apply oil within 6 weeks of harvest or later than September 15. Do not use dicofol in highly alkaline sprays.
	Oil	Exempt	0	EC	1.6 gal.	16 gal.	June 1 - September 15.	
Mite, Texas citrus (Eutetranychus banksi) Texas	Tetradifon	2	0	EC or WP	0.25	2.5	Post bloom or fall.	
Mite, false spider (Brevipalpus spp.) Texas	Chlorobenzilate	5	0	WP	0.25 - 0.5	2.5 - 5	Summer.	Limit use of chlorobenzilate to oranges, grapefruit, lemons, and tangerines; do not apply over 2.5 lb. per acre per application to grapefruits and tangerines, 5 lb. per acre to oranges, and 7.5 lb. per acre to lemons. Do not mix zineb and copper compounds.
	Sulfur	Safe	0	Wettable	5	50		
Mite, citrus rust (Phyllocoptruta oleivora) Florida	Zineb	7	--	WP	0.75	7.5	Post bloom, summer.	
	Chlorobenzilate	5	0	EC or WP	0.12	1.25	Post bloom, summer, fall.	
	Sulfur	Safe	0	Wettable D	5 --	-- 40-100	Post bloom, summer.	
	Carbophenothion	2	14	EC or WP	0.25 - 0.37	2.5 - 3.75	Post bloom, late spring, fall, or winter. Preferred use is in late fall and winter for combined control of rust mite and spider mites.	

Continued

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CITRUS								
Mite, citrus rust (Phyllocoptruta oleivora) Florida (con.)	Dioxathion	2.8	0	EC	0.25	2.5	Fall, winter.	Do not use dioxathion on citrus citron or kumquats or more than twice a year on lemons and limes. Allow at least 4 months between applications. On oranges, grapefruit, tangelos, and tangerines, make applications at least 3 months apart if fruit is present during first application. Limit use of ethion to 1 application on lemons and limes and to two applications per crop on tangerines. Do not use on citrus citron or kumquat or repeat application within 90 days on grapefruit, oranges, tangelos, and tangerines. Do not use sulfur within 4 weeks of oil, or oil when soil is very dry or temperature unusually high. Limit use of chlorobenzilate to oranges, grapefruit, lemons, and tangerines; do not apply over 2.5 lb. per acre per application to grapefruit and tangerines. Do not apply oil within 6 weeks of harvest or later than September 15, to drought-stricken trees.
	Ethion	2	21*	EC or WP	0.25	2.5		
Mite, citrus rust (Phyllocoptruta oleivora) Texas	Zineb	7	0	WP	0.75	7.5	Post bloom, before fruit is 1/2 in. in diameter, and in summer and fall if needed.	
	Sulfur	Safe	0	D	--	50 - 80	Post bloom and later when needed.	
	Chlorobenzilate	5	0	WP	0.25 - 0.5	2.5 - 5	Summer.	
Mite, citrus bud (Aceria sheldoni) California	Mineral oil, light medium	Exempt	0	EC	1.75	55 gal.	September - November and April - May.	
	Mineral oil, light medium + chlorobenzilate	Exempt + 5	0	EC + EC or WP	1.75 + 0.12	55 gal. + 3.75	When needed.	
	Chlorobenzilate	5	0	EC or WP	0.12	2	Thorough coverage with conventional sprayer when needed, preferably July-September.	
				EC or WP	--	1.5	With mist blower as needed preferably July or September.	
Scale, black (Saissetia oleae) California	Mineral oil, light medium to medium	Exempt	0	EC	1.75	55 gal.	As soon as practicable after completion of major hatch of scale. Oranges, August-October. Lemons, early spring and/or August-December.	

Continued

*No time limitation for ethion on grapefruit, orange, tangelos, or tangerines.

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CITRUS								
Scale, black (Saissetia oleae) California (con.)	Mineral oil, light to light medium + rotenone	Exempt	1	EC + WP	1.25 - 1.75 gal. + .025	40 - 55 gal. + 0.75	When treatment has been delayed and advanced stages of scale are present.	Do not use azinphosmethyl or parathion in small home plantings; should be applied only by a trained operator.
	Mineral oil, light or light medium + malathion	Exempt + 8	7	EC + EC or WP	1.75 gal. + 0.25	55 gal. + 7.5		Do not apply oil within 6 weeks of harvest or later than September 15, to drought-stricken trees, or when soil is very dry or temperature unusually high. Use oil only as emergency treatment on navel oranges. Light medium oil preferred for oranges.
	Malathion	8	7	EC or WP	0.75	22	Within one month following completion of major hatch of scale, provided brood is very even.	
Florida	Ethion + oil	2 + exempt	21*	EC + EC	0.37 + 0.7 gal.	3.75 + 7 gal.	Post bloom; June 1 - July 15.	Do not use ethion or malathion on citrus citron, or ethion on kumquat.
	Azinphosmethyl	2	7**	EC or WP	0.25 - 0.5	2.5 - 5	Post bloom or mid-May, on all varieties.	Limit use of ethion to 1 application on lemons and limes and to 2 applications per crop on tangerines. Do not repeat application within 90 days on grapefruit, oranges, tangelos, and tangerines.
	Parathion	1	14	EC or WP	0.25	2.5	Mid-May on all varieties.	
	Parathion + oil	1 + exempt	14	EC or WP + EC	0.15 + 0.5 gal.	1.5 + 5 gal.	Mid-May on grapefruit.	
Scale, brown soft (Coccus hesperidum) Texas	Carbaryl***	10	5	WP	1	10	Not during bloom.	Do not apply oil if trees are near wilting; allow 3 weeks between sulfur and oil sprays; and do not apply to fruit 3/4 - 1 1/2 in. in diameter or after July.
	Oil + carbaryl	Exempt + 10	5	EC + WP	1.6 gal. + 0.48	16 gal. + 5	June 1 - September 15.	
Scales, California red (Aonidiella aurantii), chaff (Parlatoria pergandii) and others Texas	Oil	Exempt	0	EC	1.6	16 gal.		Do not apply carbaryl more than once to citrus other than grapefruit when fruit is present.

*No time limitation for ethion on grapefruit, orange, tangelos, or tangerines.
**Do not make more than 2 applications of azinphosmethyl per year. When 2 applications are made, allow 28 days from last application to harvest.
***Increase of spider mites has followed use of carbaryl.

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CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CITRUS								
Scales, California red (A. aurantii), purple (Lepidosaphes beckii), and yellow (A. citrina) California	Mineral oil, light medium or medium	Exempt	0	EC	1.75 gal.	55 gal.	On oranges and grapefruit August 1 - October 31 in southern California; July 1 - September 15 in central California. On lemons, April-May and/or September-December in southern California; September-November in central California.	Do not use parathion in small home plantings; should be applied only by a trained operator. Do not apply oil if trees are near wilting; allow 3 weeks between sulfur and oil sprays; do not apply within 6 weeks of harvest, to drought-stricken trees, or when soil is very dry or temperature unusually high. Light medium oil preferred on oranges. Use only as emergency treatment on navel oranges.
	Mineral oil, light or light medium + malathion	Exempt + 8	7	EC + EC or WP	1.75 gal. + 0.25	55 gal. + 7.5		
	Parathion	1	30	EC or WP	0.3 - 0.6	4.5 - 9	Anytime except during bloom and before new fruit reaches 1/3 in. in diameter.	
	Parathion + malathion	1 + 8	30	EC or WP	0.25 + 0.37	3.75 + 5.5		
	Malathion	8	7	EC or WP	0.75	22	Preferably during immediate post bloom period.	
Scales, glover (L. gloverii), purple (L. beckii), Florida red (Chrysomphalus aonidum), yellow (A. citrina), and chaff (P. pergandii) Florida	Parathion	1	14	EC or WP	0.25	2.5	When needed.	Do not apply malathion or parathion during bloom or malathion on citrus citron. Do not apply oil to fruit 3/4 - 1 1/2 in. in diameter. Limit use of ethion to 1 application on lemons and limes and to 2 applications on tangerines. Do not repeat applications within 90 days on grapefruit, oranges, tangelos, or tangerines. Do not apply ethion on citrus citron or kumquat.
	Oil	Exempt	0	Emulsion	1.3 gal.	13 gal.	Post bloom, June 1 - July 15.	
	Ethion + oil	2 + exempt	21*	EC + emulsion	0.37 + 0.7 gal.	3.75 + 7 gal.		
	Parathion + oil	1 + exempt	14	EC or WP + emulsion	0.15 + 0.7 gal.	1.5 + 7 gal.	June 1 - July 15.	
	Malathion + oil	8 + exempt	7	EC or WP + emulsion	0.5 - 0.75 + 0.7 gal.	5 - 7.5 + 7 gal.		
	Malathion	8	7	EC or WP	0.75 - 1.25	7.5 - 12.5	When needed.	

*No time limitation for ethion on grapefruit, oranges, tangelos, or tangerines.

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CITRUS								
Scale, citrus snow (Unaspis citri)* Florida	Azinphosmethyl	2	7	WP	0.25 - 0.5	2.5 - 5	Post bloom, June 1 - July 15.	Do not use azinphosmethyl or parathion in small home plantings; should be applied only by a trained operator.
	Ethion + oil	2 + exempt	21**	EC + emulsion	0.37 + 0.7 gal.	3.75 + 7 gal.		
	Malathion	8	7	EC or WP	1.25	12.5		Do not make more than 2 applications of azinphosmethyl per year. When 2 applications are made, allow 28 days from last application to harvest.
	Malathion + oil	8 + exempt	7	EC or WP + emulsion	0.75 + 0.5 gal.	7.5 + 5 gal.		
	Oil	Exempt	0	EC or emulsion	1.3 gal.	13 gal.		
	Parathion	1	14	EC or WP	0.25	2.5		Do not apply oil if trees are near wilting; allow 3 weeks between sulfur and oil sprays and do not apply to fruit 3/4 - 1 1/2 in. in diameter.
	Parathion + oil	1 + exempt	14	EC or WP + emulsion	0.15 + 0.7 gal.	1.5 + 7 gal.		
Whiteflies (Dialeurodes spp.) Florida	Oil	Exempt	0	EC or WP	1.3 gal.	13 gal.		Limit use of ethion to 1 application on lemons and limes and to 2 applications on tangerines. Do not repeat applications within 90 days on grapefruit, oranges, tangelos, or tangerines.
	Parathion	1	14	EC or WP	0.25	2.5		Do not use ethion or malathion on citrus citron or ethion on kumquat.
GRAPE								
Climbing cutworms	DDT	7	40	WP	1	3	As buds are swelling.	Do not use parathion in small home plantings; should be applied only by a trained operator.
				D	--	2	To lower part of vine and ground as buds are swelling	
European fruit lecanium (Lecanium corni)	Malathion	8	3	EC	0.9	2.75	When newly hatched nymphs are migrating over vines, usually shortly after bloom.	
	Parathion	1	14	WP	0.15	0.5		

*Complete coverage of trunks and branches is necessary for control of snow scale.

**No time limitation for ethion on grapefruit, oranges, tangelos, or tangerines.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
GRAPE								
Grape berry moth (Paralobesia viteana)	Azinphosmethyl	5	1	WP	0.25	0.75	At petal fall, 7-14 days later, when second-brood eggs are found (35-45 days after bloom), and 14 days later.	Do not use azinphosmethyl or parathion in small home plantings; should be applied only by a trained operator. Limit use of azinphosmethyl to 3 applications per season. Do not use a sticker with DDT if application is made after grapes reach buckshot stage.
	Carbaryl	10	1	WP	1	3		
	DDT	7	40	WP	0.75	2.25		
	DDT + parathion	7 + 1	40	WP + WP	0.75+0.15	2.25+0.5		
	Diazinon	0.75	10	WP	0.3	1		
	Methoxychlor	14	14	WP	1	3		
	Methoxychlor + parathion	14 + 1	14	WP + WP	1 + 0.15	3 + 0.5		
	Parathion	1	14	WP	0.15	0.5		
	Parathion + carbaryl	1 + 10	14	WP + WP	0.15 + 1	0.5 + 3		
Grape cane gall maker (Ampeloglypter sesostris)	Azinphosmethyl	5	1	WP	0.25	0.75	When first girdles or cane punctures and swellings are seen.	
Grape flea beetle (Altica chalybea)	DDT	7	40	WP	1	3	Early spring when buds begin to swell, if adults appear, or when shoots are 6-8 in. long if larvae are present.	
Grape leaf folder (Desmia funeralis)	DDT	7	40	WP	0.75	2.25	When adults or small larvae appear. Schedule for grape berry moth gives control.	
Grape leafhopper (Erythroneura comes)	DDT	7	40	WP	0.75	2.25	Petal fall and 7-14 days later.	Endosulfan may cause severe injury to Concord variety.
	Endosulfan	2	7	WP	0.5	1.5	When leafhoppers appear.	

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
GRAPE								
Grape mealybug (Pseudococcus maritimus)	Malathion	8	3	EC	0.9	2.75	When overwintered nymphs move out from under bark to base of buds or onto grape clusters (just before or after bloom); repeat in 10 days if needed.	Do not use parathion in small home plantings; should be applied only by a trained operator. Malathion EC may injure the Ribier, Italia, Cardinal, and Almeria varieties if applied after clusters appear.
	Parathion	1	14	WP	0.3	1		
Grape phylloxera (leaf form only) (Phylloxera vitifoliae)	Lindane	10	--	WP	0.3	1	When galls first appear on leaves; repeat in 7-10 days.	
Grape rootworm (Fidia viticida)	DDT	7	40	WP	0.75	2.25	Petal fall and 7-14 days later.	Do not use a sticker with DDT if application is made after grapes reach buckshot stage. Do not use lindane later than 1 month after bloom.
Grapevine aphid (Aphis illinoisensis)	Malathion	8	3	EC or WP	0.66	2	When aphids appear on shoots.	
	Parathion	1	14	WP	0.15	0.5		
Japanese beetle (Popillia japonica)	Carbaryl	10	1	WP	1	3	When beetles appear; repeat 10-14 days later if needed.	
	DDT	7	40	EC or WP	1	3		
				D	1.5	4.5		
	Methoxychlor	14	14	EC or WP	1.5	4.5		
	Malathion	8	3	EC or WP	0.66	2	When beetles appear; repeat every 7 - 10 days as long as needed.	
	Parathion	1	14	WP	0.3	1		
	Rotenone	Exempt	1	Powder	0.12	0.5		
Leaf-eating caterpillars	DDT	7	40	WP	1	3	If program for grape berry moth is not effective, apply when caterpillars appear.	Do not apply lead arsenate after fruit begins to form. Lead arsenate should be applied with an equal amount of hydrated lime or other safener.
	Lead arsenate	7 (combined lead)	--	Powder	3	9		
Red-banded leaf roller (Argyrotaenia velutinana)	Lead arsenate	7 (combined lead)	--	Powder	3	9	Just before bloom.	
	Carbaryl	10	1	WP	1	3	Just before bloom or at petal fall and for early stages of first and second broods.	
	Parathion	1	14	WP	0.3	1		

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
GRAPE								
Rose chafer (Macrodactylus subspinosus)	DDT	7	40	WP	1	3	When adults first appear, usually near bloom of Concord grapes.	Do not use parathion in small home plantings; should be applied only by a trained operator.
	Methoxychlor	14	14	WP	1	3		
Two-spotted spider mite (Tetranychus urticae)	Dicofol	5	7	EC or WP	0.37	1.25	When mites first appear, and 7 days later if infestation is heavy.	Do not use a sticker with DDT if application is made after grapes reach buckshot stage.
	Malathion	8	3	EC or WP	0.66	2		Malathion EC may injure the Ribier, Italia, Cardinal, and Almeria varieties if applied after clusters appear.
	Parathion	1	14	WP	0.15	0.5		
	Tetradifon	5	1	WP	0.25	0.75		Do not apply tetradifon more than 3 times during fruiting period.
MANGO AND PASSION FRUIT								
Oriental fruit fly (Dacus dorsalis) and melon fly (D. cucurbitae)	Malathion + protein hydrolysate	8	2	WP + liquid or powder	--	0.5 + 1	Every 10-14 days while flies are on fruit.	
PEACH AND APRICOT								
Aphids (on foliage)	Demeton	0.75	30	EC	0.25	2	Early in season when aphids appear.	Do not use azinphosmethyl, demeton, EPN, or parathion in small home plantings; should be applied only by a trained operator.
	Endosulfan	2	30	WP	0.5	4		
	Malathion	8	7	EC or WP	0.5	4		
	Parathion	1	14*	WP	0.25	2		Do not make more than 3 applications of demeton per season.
Borer, American plum (Euzophera semifuneralis)	Azinphosmethyl	2	21	EC or WP	0.3	2.5	3-4 times at 21-day intervals, beginning in June.	Do not apply endosulfan more than 2 times during the fruiting period; do not allow animals to graze in treated orchards.
	DDT	7	30	WP	0.5	4		
	EPN	3	21	WP	0.5	4		
	Parathion	1	14*	WP	0.3	2.5		Do not apply more than 5 lb. of parathion per acre per year. In California do not apply more than once after bloom.

Continued

*In California allow 21 days between application and harvest.

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEACH AND APRICOT								
Borer, American plum (Euzophera semifuneralis) (con.)	Endosulfan	2	30	WP	0.75	1.5	To trunks and main branches when adults appear and again as recommended in first application for peach tree borer.	Do not use azinphosmethyl or parathion in small home plantings; should be applied only by a trained operator. Do not apply endosulfan more than 2 times during fruiting period; do not allow animals to graze in treated orchards. Do not apply more than 5 lb. of parathion per acre per year. In California do not apply more than once after bloom.
Borer, lesser peach tree (Synanthedon pictipes)	Azinphosmethyl	2	21	WP	0.3	0.6	To trunks and scaffold limbs 4 times in the Northeast at 3-week intervals, beginning with emergence in May. In Georgia twice 4 weeks apart, for first brood (April and May) and for second brood (August and September).	
	Malathion	8	7	WP	1	2		
	Parathion	1	14*	WP	0.3	0.6		
	Endosulfan	2	30	WP	0.75	1.5	To trunks and main branches when adults appear and again as recommended in first application for peach tree borer.	
	Paradichlorobenzene + crude cottonseed oil (In South only)	--	--	1 lb. + 2 qt.	--	--	Paint infested areas in fall or in spring after weather is warm.	Do not apply paradichlorobenzene to healthy tissue or when fruit is present. Keep crystals from touching trees.
Borer, peach tree (Sanninoidea exitiosa) All areas	Azinphosmethyl	2	21	EC or WP	0.3	0.6	In latitude of Virginia and northward twice to trunks (July 1-15 and 3-4 weeks later); southward 3 times (July 10-15 and after 3-4 week intervals); in south Georgia 4 times at 4-week intervals beginning August 1.	Do not make more than 1 application of DDT within 6 weeks of harvest.
	DDT (home orchards only)	7	30	WP	3-4	6-8		
	Parathion	1	14*	WP	0.3	0.6		

Continued

*In California allow 21 days between last application and harvest.

CROP AND INSECTICIDE	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEACH AND APRICOT								
Borer, peach tree (Sanninoidea exitiosa) All areas (con.)	Endosulfan	2	30	WP	5	--	Dip roots of nursery trees prior to planting.	Do not use azinphosmethyl or parathion in small home plantings; should be applied only by a trained operator. Do not apply endosulfan more than 2 times during fruiting period; do not allow animals to graze in treated orchards. Do not apply paradichlorobenzene to healthy tissue or when fruit is present. Keep crystals from touching trees.
	Paradichlorobenzene	--	--	Crystals	--	0.25 - 1.5 oz./tree	To ground in ring around trunk in late August or early September in North to late October in South.	
Southern States	Endosulfan	2	30	WP	0.75	1.5	To trunks from ground to scaffold limbs immediately after harvest and repeat 3 - 4 weeks later.	
Other States	Endosulfan	2	30	WP	0.75	1.5	To trunks from ground to scaffold limbs when emergence starts and again 3 weeks later.	
Borer, peach twig (Anarsia lineatella)	Azinphosmethyl	2	21	EC or WP	0.25	2	Prepink or petal fall and 10 days later if needed.	Do not make more than 1 application of DDT within 6 weeks of harvest. Do not apply more than 5 lb. of parathion per acre per year. In California do not apply more than once after bloom.
	DDT	7	30	WP	1	8		
	DDT + parathion	7 + 1	30	WP + WP	1 + 0.25	5 + 1.25		
	Endosulfan	2	30	WP	0.5	3	Just before bloom and at petal fall.	
Borer, shot-hole (Scolytus rugulosus) and peach bark beetle (Phloeotribus liminaris)	DDT	7	30	WP	1	8	When beetles are active in late May or June and in September after crop is harvested.	
	DDT + parathion	7 + 1	30	WP + WP	0.5 + 0.25	4 + 2		
	Parathion	1	14*	WP	0.3	2.5		
Climbing cutworms	DDT	7	30	WP	1	2	On lower trunk and surrounding soil in early spring when cutworms appear.	
Earwigs	DDT	7	30	WP	1	2	To trunk and surrounding soil a month before fruit ripens.	

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FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEACH AND APRICOT								
Grasshoppers	Carbaryl	10	3	WP	--	1	Spray ground cover and fence rows with 100 gal. per acre when grasshoppers become numerous	Do not use azinphosmethyl or parathion in small home plantings; should be applied only by a trained operator.
	Malathion	8	7	EC	--	1		
Green June beetle (Cotinis nitida)	Carbaryl	10	3	WP	1	8	When adults appear on fruit.	
Japanese beetle (Popillia japonica)	Carbaryl	10	3	WP	1	8	When beetles appear; repeat after 10-14 days if needed.	
	DDT	7	30	EC or WP	1	8		Do not make more than 1 application of DDT within 6 weeks of harvest.
	Malathion	8	7	EC or WP	0.5	4		
	Methoxychlor	14	21	EC or WP	1.5	12		
	Parathion	1	14*	WP	0.3	2.5		Do not apply more than 5 lb. of parathion per acre per year. In California do not apply more than once after bloom.
	Rotenone	Exempt	1	Powder	0.12	1	When beetles appear; repeat every 7 - 10 days as needed.	
Leaf rollers, red-banded (Argyrotaenia velutinana) and Platynota flavedana	Azinphosmethyl	2	21	WP	0.3	2.5	When leaf rollers become active, about July 1.	
	Carbaryl	10	3	WP	1	8		
	Parathion	1	14*	WP	0.3	2.5		
	TDE	7	30	WP	0.75	6		
Mites, European red (Panonychus ulmi) and two-spotted spider (Tetranychus urticae)	Mineral oil (Superior)	Exempt	--	EC	2 gal.	10 gal.	Dormant.	
	(Other)	Exempt	--	EC	3 gal.	15 gal.		
	Ovex (Peaches only)	3	30	WP	0.25	2	At shuck split and first cover.	After shuck split do not make more than 1 application of tetradifon at 2 lb. or 2 applications at 1 lb. per acre.
	Tetradifon	5	1	WP	0.12 - 0.25	1 - 2	At shuck split or in summer; 1 or 2 applications as required.	

Continued

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CROP AND INSECTICIDE	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEACH AND APRICOT								
Mites, European red (Panonychus ulmi) and two-spotted spider (Tetranychus urticae) (con.)	Demeton	0.75	30	EC	0.25	2	In summer; repeat after 7 - 10 days if needed.	Do not use azinphosmethyl, demeton, EPN, parathion, or tepp in small home plantings; should be applied only by a trained operator. Do not make more than 3 applications of demeton per season. Do not repeat applications of dicofol within 30 days. Do not make more than 1 application of DDT within 6 weeks of harvest. Do not apply more than 5 lb. of parathion per acre per year. In California do not apply more than once after bloom.
	Dicofol	10	14	EC or WP	0.37	3		
Oriental fruit moth (Grapholitha molesta) Pacific Northwest	Azinphosmethyl	2	21	EC or WP	0.25	2	At shuck split, 10-12 days later and, if needed, 6 and 3 weeks before harvest of varieties ripening 10-15 days before standard Elberta and thereafter.	
	Carbaryl	10	3	WP	0.37	3		
	DDT	7	30	WP	1	8		
	Parathion	1	14*	WP	0.3	2.5		
Other areas	Azinphosmethyl	2	21	EC or WP	0.25	2	3 times at 10-day intervals beginning at shuck split; or for DDT at 8 and 4 weeks before harvest and for other materials at 6 and 2-3 weeks before harvest.	
	Carbaryl	10	3	WP	1	8		
	DDT	7	30	WP	1	8		
	EPN	3	21	WP	0.37	3		
	Parathion	1	14*	WP	0.3	2.5		
Pandemis moth (Pandemis albaniana)	Parathion	1	14*	WP	0.3	2.5	Early spring when larvae appear.	
Periodical cicadas (Magicicada spp.)	Carbaryl	10	3	WP	1	8	Late May or early June when adults start emerging, early in morning before they become active; repeat every 3-5 days as needed.	
	Tepp	0	3	EC	0.19	1.5		
Plum curculio (Conotrachelus nenuphar)	Azinphosmethyl	2	21	WP	0.3	2.5	In South at petal fall, 10 days later, 7 - 10 days later, and 4 - 5 and 3 weeks before harvest. In North 3 - 4 times 7 - 10 days apart, beginning at shuck-off.	
	EPN	3	21	WP	0.37	3		
	Malathion	8	7	WP	0.75	6		
	Methoxychlor	14	21	WP	1.5	12		
Continued	Parathion	1	14*	WP	0.3	2.5		

*In California allow 21 days between last application and harvest.

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEACH AND APRICOT								
Plum curculio (Conotrachelus nenuphar) (con.)	Dieldrin	0.1	45	WP	0.25 - 0.5	2-4	Can be substituted for other materials in petal fall and first cover if applied at least 45 days before harvest.	Do not use azinphosmethyl, EPN, or parathion in small home plantings; should be applied only by a trained operator.
	Aldrin (peaches only)	0.1	--	WP, D, or G	--	2	Ground cover application in spring before petal fall in Southeastern States. Work into soil.	Do not use dieldrin after second cover.
	Dieldrin	0.1	45	WP, D, or G	--	2		Do not apply more than 5 lb. of parathion per acre per year. In California do not apply more than once after bloom.
	Heptachlor (peaches only)	0	--	WP, D, or G	--	2		
	Carbaryl	10	3	WP	1	8	Use when application is needed close to harvest.	
Rose chafer (Macrodactylus subspinosus)	DDT	7	30	WP	1	8	When chafers appear.	
	EPN	3	21	WP	0.37	3		
	Parathion	1	14*	WP	0.3	2.5		
Scales, European fruit (Aspidiotus ostreaeformis), terrapin (Lecanium nigrofasciatum), and cottony peach (Pulvinaria amygdali)	Azinphosmethyl	2	21	WP	0.25	2	At completion of hatching; a second application may be made if infestation persists.	
	Carbaryl	10	3	WP	1	8		
	Malathion (home orchard only)	8	7	EC or WP	1	8		
	Parathion	1	14*	WP	0.3	2.5		
Scales, Forbes (Aspidiotus forbesi), San Jose (A. perniciosus), walnut (A. juglansregiae), and white peach (Pseudaulacaspis pentagona)	Mineral oil (Superior)	Exempt	--	EC	2 gal.	10 gal.	Dormant.	
	Azinphosmethyl	2	21	WP	0.3	2.5	When crawlers are active.	
	Carbaryl	10	3	WP	0.5	4		
	Malathion (home orchard only)	8	7	WP	1	8		
	Parathion	1	14*	WP	0.3	2.5		

Continued

*In California allow 21 days between last application and harvest.

CROP AND INSECTICIDE	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEACH AND APRICOT								
Scales, Forbes (Aspidiotus forbesi), San Jose (A. perniciosus), walnut (A. juglansregiae), and white peach (Pseudaulacaspis pentagona) (con.)	Mineral oil + lime sulfur (Pacific Northwest only)	Exempt	--	EC + liquid	1 gal. + 3 gal.	5 gal. + 15 gal.	Dormant or delayed dormant.	Do not use azinphosmethyl or parathion in small home plantings; should be applied only by a trained operator. Do not apply more than 5 lb. of parathion per acre per year. In California do not apply more than once after bloom. Do not use dieldrin after second cover.
	Diazinon (Pacific Northwest only)	0.75	20 peaches 10 apricots	WP	0.5	3	Pink or shuck split.	
	Parathion (Pacific Northwest only)	1	14*	WP	0.25	1.5		
Stink bugs	Dieldrin	0.1	45	WP	0.25	2	Petal fall and first cover.	
	Azinphosmethyl	2	21	WP	0.3	2.5	Petal fall and 2 - 3 times 10 days apart.	
	Carbaryl	10	3	WP	1	8		
	Parathion	1	14*	WP	0.3	2.5		
Tarnished plant bug (Lygus lineolaris)	Azinphosmethyl	2	21	WP	0.3	2	Just before bloom and at petal fall.	
	DDT	7	30	WP	1	6		
	Dieldrin	0.1	45	WP	0.25	1.5		
	Parathion	1	14*	WP	0.3	2		
PEAR								
Aphids, apple (Aphis pomi), and apple grain (Rhopalosiphum fitchii)	Dinitrocresol	0	--	WP	0.5	3	Dormant.	Do not use demeton or tepp in small home plantings; should be applied only by a trained operator. Do not apply demeton more than 3 times per season.
	Benzene hexachloride	5	60**	WP	0.25 (gamma)	2	Prepink or pink.	
	Lindane	10	60	WP	0.25	2		
	Demeton	0.75	21	EC	0.19	1.5	Prepink or pink or when aphids appear.	
	Diazinon	0.75	14	WP	0.25	2.5	When aphids become abundant.	
	Malathion (home orchard only)	8	1	WP	0.5	5		
	Tepp	0	3	EC	0.12	1.25		

*In California allow 21 days between last application and harvest.
**Or not after fruit starts to form.

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEAR								
Borer, roundheaded apple tree (Saperda candida)	DDT	7	30	WP	1	10	3 weeks after petal fall and 2 - 3 weeks later.	Do not use azinphosmethyl or parathion in small home plantings; should be applied only by a trained operator.
	Lead arsenate	7 (combined lead)	40	WP	3	30		
Borer, shot-hole (Scolytus rugulosus)	DDT	7	30	WP	1	10	When adults are active in May and September or after harvest.	Remove excess residue of lead arsenate at harvest. Lead arsenate should be mixed with an equal amount of hydrated lime or other safener.
	Parathion	1	14	WP	0.3	3		
Climbing cutworms	DDT	7	30	WP	1	2	To trunk and surrounding soil when opening buds are attacked.	
Codling moth (Carpocapsa pomonella)	Carbaryl	10	1	WP	0.5	5	2 - 4 cover sprays beginning with first cover.	Do not use carbaryl before 30 days after full bloom.
	DDT*	7	30	WP	1	10		
	Azinphosmethyl	2	15	WP	0.3	3		
	Parathion	1	14	WP	0.25	2.5		
Fruit-tree leaf roller (Archips argyrospilus)	Mineral oil	Exempt	--	EC	3 gal.	18 gal.	Dormant.	
	Azinphosmethyl	2	15	WP	0.25	2	When buds begin to separate.	
	DDT	7	30	WP	1	8		
	Lead arsenate	7 (combined lead)	40	WP	4	32		
	Parathion	1	14	WP	0.3	3	Petal fall and 10 days later.	
Fruitworms	Azinphosmethyl	2	15	WP	0.25	2.5	Calyx or first cover.	
	DDT	7	30	WP	1	10		
	Lead arsenate	7 (combined lead)	40	WP	3	30		
Grasshoppers	Carbaryl	10	1	WP	--	1	Spray ground cover and fence rows.	
	Malathion	8	1	EC	--	1		

*Not effective in Pacific Northwest.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEAR								
Mite, pear rust (Epitrimerus pyri)	Carbaryl	10	1	WP	1	10	Once, when mites appear.	Do not use demeton or tepp in small home plantings; should be applied only by a trained operator. Do not use carbaryl before 30 days after full bloom. Do not apply binapacryl more than 3 times during the fruiting period. Do not apply if oil has been applied to the foliage and do not apply oil within 21 days after a binapacryl treatment. Do not apply demeton more than 3 times per season. After first cover do not make more than 1 application of tetradifon at 2.5 lb. or 2 applications at 1.25 lb. per acre. Do not feed pomace from fruit treated with tetradifon to livestock. Do not apply Morestan after first bloom.
	Dicofol	5	7	EC or WP	0.37	3.75		
Mites, brown (Bryobia rubrioculus) and European red (Panonychus ulmi)	Mineral oil (Superior)	Exempt	--	EC	2 gal.	12 gal.	Late dormant to delayed dormant.	
	Mineral oil + lime sulfur*	Exempt + Safe	--	Liquid	2 gal. + 3 gal.	12 gal. + 18 gal.		
	Binapacryl	--	60	WP	0.19	2	In cover sprays as needed.	
	Demeton	0.75	21	EC	0.19	1.5	Pink.	
	Tetradifon	5	1	WP	0.12 - 0.25	1.25 - 2.5	Petal fall or first cover if prebloom treatment was omitted.	
	Chlorobenzilate	5	7	WP	0.37	3.75	2 - 3 times in summer 7 - 10 days apart when infestation threatens except, in West, in first or second and in third cover sprays.	
	Dicofol	5	7	EC or WP	0.37	3.75		
	Morestan	--	--	WP	0.25	2	Prepink or pink.	
	Tepp	0	3	EC	0.12	1.25	Cover sprays, 2 - 3 times 7 days apart.	
Mite, pear leaf blister (Eriophyes pyri) All areas	Demeton	0.75	21	EC	0.19	2	In spring or summer when dormant treatment was omitted or ineffective.	
	Diazinon	0.75	14	WP	0.5	5	In early fall after harvest.	
	Carbaryl	10	1	WP	1	10	In fall when mites are migrating from leaves to buds or late in dormant season just as buds are swelling.	
	Lime sulfur	Safe	--	Liquid	2.5 gal.	25 gal.		

Continued

*Use in Pacific Northwest only.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEAR								
Mite, pear leaf blister (Eriophyes pyri) All areas (con.)	Lime sulfur + wettable sulfur	Safe	--	Liquid + powder	4 gal. + 2	40 gal. +20	In early fall after harvest.	Do not use azinphosmethyl or tepp in small home plantings; should be applied only by a trained operator.
	Mineral oil	Exempt	--	EC	3 gal.	18 gal.	Just as buds are swelling.	
Pacific Northwest	Mineral oil + lime sulfur	Exempt + Safe	--	EC + liquid	2 gal. + 3 gal.	12 gal. + 18 gal.		
Mites, two-spotted spider (Tetranychus urticae), McDaniel (T. mcdanieli), and related species	Binapacryl	--	60	WP	0.19	2	In cover sprays as needed.	Do not apply binapacryl more than 3 times during fruiting period. Do not apply if oil has been applied to the foliage and do not apply oil within 21 days after a binapacryl application.
	Chlorbenzilate	5	7	WP	0.37	3.75	2 - 3 times in summer 7 - 10 days apart when infestation threatens except, in West, in first or second and in third cover sprays.	
	Dicofol	5	7	EC or WP	0.37	3.75		
	Tetradifon	5	1	WP	0.25	2.5	When infestation starts. In 2 applications as needed.	After first cover, do not make more than 1 application of tetradifon at 2.5 lb. or 2 applications at 1.25 lb. per acre. Do not feed pomace from fruit treated with tetradifon to livestock.
				WP	0.12	1.25		
	Tepp	0	3	EC	0.12	1.25	Cover sprays, 2 - 3 times 7 days apart.	
Pear midge (Contarinia pyrivora)	Azinphosmethyl	2	15	WP	0.25	2.5	Just before sepals separate and 7 days later.	
	DDT	7	30	WP	1	10		
Pear psylla (Psylla pyricola) All areas	Mineral oil (Superior)	Exempt	--	EC	2 gal.	12 gal.	Delayed dormant.	
	(Other)	Exempt	--	EC	3 gal.	18 gal.		
	Summer oil (Superior)	Exempt	--	EC	0.75 gal.	7.5 gal.	In summer when psyllas occur in numbers.	
	Azinphosmethyl*	2	15	WP	0.3	3	Petal fall and in summer when psyllas occur in numbers.	Do not use Perthane in more than 2 cover sprays at least 30 days apart.
	Perthane	15	7	EC	1	10		

Continued

*Not effective in Pacific Northwest.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEAR								
Pear psylla (Psylla pyricola) All areas (con.)	Dilan	--	--	WP	0.5	5	On nonbearing trees or after harvest of bearing trees when psyllas occur in numbers.	Do not use azinphosmethyl, parathion, or tepp in small home plantings; should be applied only by a trained operator. Do not use Dilan while fruit is present. Do not graze livestock in treated orchards or feed crop waste or other edible parts. Do not apply Morestan after first bloom.
Pacific Northwest	Mineral oil + lime sulfur	Exempt + Safe	--	EC + liquid	3 gal. + 3 gal.	18 gal. + 18 gal.	Delayed dormant.	
	Morestan	--	--	WP	0.25	1.5		
Pear slug (Caliroa cerasi)	DDT	7	30	WP	1	10	2 weeks after bloom.	
	Parathion	1	14	WP	0.25	2.5		
Pear thrips (Taeniothrips inconsequens)	DDT	7	30	WP	1	6	When half of buds are in green-tip stage.	
Periodical cicadas (Magicicada spp.)	Carbaryl	10	1	WP	1	10	Late May or early June when adults emerge; repeat every 3 - 5 days as needed; early in morning before cicadas are active.	Do not use carbaryl before 30 days after full bloom.
	Tepp	0	3	EC	0.12	1.25		
Plum curculio (Conotrachelus nenuphar)	Azinphosmethyl	2	15	WP	0.37	3.75	At petal fall and 10 days later.	Remove excess residue of lead arsenate at harvest. Lead arsenate should be mixed with an equal amount of hydrated lime or other safener.
	Lead arsenate	7 (combined lead)	40	WP	3	30		
	Methoxychlor	14	7	WP	1.5	15		
	Parathion	1	14	WP	0.3	3		
Scales, Forbes (Aspidiotus forbesi), and San Jose (A. perniciosus) All areas	Mineral oil (Superior)	Exempt	--	EC	2 gal.	12 gal.	Dormant, or delayed dormant.	
	Azinphosmethyl	2	15	WP	0.3	3	When crawlers are present--about first or second cover and last half of July.	
	Parathion	1	14	WP	0.25	2.5		

Continued

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PEAR								
Scales, Forbes (Aspidiotus forbesi), and San Jose (A. perniciosus) (con.) Pacific Northwest	Mineral oil + lime sulfur	Exempt + Safe	--	EC + liquid	2 gal. + 3 gal.	12 gal. + 18 gal.	Dormant or delayed dormant.	Do not use parathion in small home plantings; should be applied only by a trained operator.
	Parathion	1	14	WP	0.25	2	1 within 2 weeks before prepink.	
Scale, scurfy (Chionaspis fufura)	DDT	7	30	WP	1	10	When eggs are hatching, usually calyx and first cover.	
	Parathion	1	14	WP	0.3	3		
Syneta leaf beetle (Syneta albida)	DDT	7	30	WP	1	10	Calyx and 10-14 days later if infestation is severe.	Remove excess residue of lead arsenate at harvest. Lead arsenate should be mixed with an equal amount of hydrated lime or other safener.
	Lead arsenate	7 (combined lead)	40	WP	3	30		
Treehoppers	Mineral oil	Exempt	--	EC	4 gal.	24 gal.	Dormant.	
	DDT	7	30	WP	0.5	5	June and July to ground cover as well as trees.	
PLUM AND PRUNE								
Aphids	Mineral oil (Superior)	Exempt	--	EC	3 gal.	15 gal.	Dormant.	Do not use azinphosmethyl, demeton, EPN, or parathion in small home plantings; should be applied only by a trained operator. Do not apply demeton more than 3 times per season.
	Demeton	0.75	30	EC	0.25	2	When aphids first appear.	
	Diazinon	0.75	10	WP	0.5	4		
	Malathion	8	3	WP or EC	0.5	4		
	Parathion	1	14	WP	0.25	2		
Borer, American plum (Euzophera semi-funeralis)	Azinphosmethyl	2	15	WP	0.5	4	3-4 times at 3-week intervals beginning in June.	Do not apply azinphosmethyl to plums and prunes more than 8 times per season.
	DDT	7	30	WP	1.5	12		
	EPN	3	21	WP	0.3	2.5		
	Parathion	1	14	WP	0.5	4		

Continued

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CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PLUM AND PRUNE								
Borer, American plum (Euzophera semifuneralis) (con.)	Endosulfan	2	7	WP	0.75	1.5	To trunks and main branches when adults appear and again as recommended in first application for peach tree borer.	Do not use azinphosmethyl or parathion in small home plantings; should be applied only by a trained operator. Apply endosulfan only on bark from scaffold branches to ground. Do not apply azinphosmethyl to plums and prunes more than 8 times per season.
Borer, lesser peach tree (Synanthedon pictipes)	Azinphosmethyl	2	15	WP	0.5	1	To trunks and scaffold limbs 4 times at 3-week intervals, beginning with emergence in June. In Georgia twice 4 weeks apart, for first brood (April and May) and second brood (August and September).	
	Endosulfan	2	7	WP	0.75	1.5		
	Malathion	8	3	WP	1	2		
	Parathion	1	14	WP	0.5	1		
	Paradichlorobenzene + crude cottonseed oil (In South only)	--	--	Crystals + oil	--	1 lb. + 2 qt.	Paint infested areas in fall or spring when weather is warm.	Do not apply paradichlorobenzene to healthy tissue or when fruit is present. Keep crystals from touching trees.
Borer, peach tree (Sanninoidea exitiosa)	Azinphosmethyl	2	15	WP	0.5	1	In latitude of Virginia and northward 2 applications to trunks (July 1-15 and 3-4 weeks later); southward 3 (July 10-15 and after 3-4 week intervals); in south Georgia 4 at 4-week intervals beginning August 1.	
	Endosulfan	2	7	WP	0.75	1.5		
	Parathion	1	14	WP	0.5	1		
	Ethylene dichloride	--	--	7.5% emulsion	--	0.12 pt. per tree for trees under 4 years old	To ground in ring around trunk in fall or first warm spell in spring.	Do not pour or spray ethylene dichloride onto trunk.
				20% emulsion	--	0.5 pt. per tree for trees over 4 years old		

Continued

FRUIT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PLUM AND PRUNE								
Borer, peach tree (Sanninoidea exitiosa)	Paradichloro-benzene	--	--	Crystals	--	0.25 - 1.5 oz./tree	To ground in ring around trunk in late August to early September in North, to late October in South.	Do not use azinphosmethyl, parathion, or tepp in small home plantings; should be applied only by a trained operator.
Borer, peach twig (Anarsia lineatella)	Azinphosmethyl	2	15	WP	0.25	1.5	Petal fall and 10 days later if infestation persists.	Do not apply paradichloro-benzene to healthy tissue or when fruit is present. Keep crystals from touching trees.
	DDT	7	30	WP	1	6		
	DDT + parathion	7 + 1	30	WP + WP	1 + 0.25	6 + 1.5		
Borer, shot-hole (Scolytus rugulosus)	DDT	7	30	WP	1	8	When beetles are active, usually in late May or June and September or after harvest.	Do not apply azinphos-methyl to plums and prunes more than 8 times per season.
	DDT + parathion	7 + 1	30	WP + WP	0.5 + 0.25	4 + 2		
	Parathion	1	14	WP	0.3	2.5		
Eye-spotted bud moth (Spilonota ocellana)	Lead arsenate	7 (combined lead)	30	WP	3	24	Just as tips of leaves are pushing out from buds; if infestation is serious, repeat in 7 - 10 days.	Remove excess residue of lead arsenate at harvest. Lead arsenate should be mixed with an equal amount of hydrated lime or other safener.
Mites, European red (Panonychus ulmi), two-spotted spider (Tetranychus urticae), and McDaniel (T. mcdanieli)	Mineral oil (Superior)	Exempt	--	EC	2 gal.	10 gal.	Dormant.	Do not apply binapacryl more than 2 times after petal fall.
	(Other)	Exempt	--	EC	3 gal.	15 gal.		
	Binapacryl	--	60	WP	0.25	2	In summer; repeat after 7 - 10 days if needed.	Do not repeat application of dicofol within 30 days.
	Dicofol	5	7	EC or WP	0.25	2		
	Parathion	1	14	WP	0.25	2		
	Tepp	0	3	EC	0.19	1.5		
	Tetradifon	5	1	WP	0.25	2		Do not make more than 3 applications of tetradifon during fruiting period.
Mites, plum rust (Aculus fockeui)	Dicofol	5	7	WP	0.25	2	When mites first appear; repeat if necessary.	
	Endosulfan	2	7	WP	0.3	2.5		

CROP AND INSECTICIDE	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PLUM AND PRUNE								
Plum curculio (Conotrachelus nenuphar)	Azinphosmethyl	2	15	WP	0.5	4	3-4 times every 10 days beginning at petal fall.	Do not use azinphosmethyl, EPN, or parathion in small home plantings; should be applied only by a trained operator. Do not apply azinphosmethyl to plums and prunes more than 8 times per season.
	EPN	3	21	WP	0.37	3		
	Methoxychlor	14	7	WP	1.5	12		
	Parathion	1	14	WP	0.3	2.5		
Scales, Forbes (Aspidiotus forbesi), and San Jose (A. perniciosus) All areas	Mineral oil (Superior)	Exempt	--	EC	2 gal.	10 gal.	Dormant.	
	Carbaryl	10	3	WP	0.75	6	When crawlers are active.	
	Malathion (home orchard only)	8	3	WP	1	8		
	Parathion	1	14	WP	0.25	2		
Pacific Northwest	Mineral oil + lime sulfur	Exempt + Safe	--	EC + liquid	1 gal. + 3 gal.	5 gal. + 15 gal.	Dormant or delayed dormant.	
	Parathion	1	14	WP	0.5	4	7-10 days after petal fall.	
Scale, oystershell (Lepidosaphes ulmi)	DDT	7	30	WP	1	8	When eggs are hatching, usually calyx and first cover.	
	Parathion	1	14	WP	0.3	2.5		

GRAIN INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CORN							
Armyworm (Pseudaletia unipuncta)	Carbaryl	5 corn* 25 fodder or forage	--	WP	1.5	When larvae are young.	Compound 4072, parathion, and phorate should be applied only by a trained operator.
	DDT	--	--	EC	1.5		Do not feed forage, including ensilage, treated with DDT or toxaphene to dairy animals or animals being finished for slaughter.
	Parathion	1	12	EC	0.25		
	Toxaphene	7	--	EC	2		
Chinch bug (Blissus leucopterus) Border rows	Toxaphene	7	--	EC	2	To base of plants where bugs congregate; coat or wet bugs.	
Corn earworm (Heliothis zea)	Carbaryl	5 corn* 25 fodder or forage	--	WP	1.5 in 25 gal.	Apply in 25 gallons of water per acre to larvae at a pressure of 100-140 lb./sq. in. On young plants direct spray into whorls of plant. As soon as silks appear, wet silks thoroughly at 1- or 2-day intervals.	
	DDT	--	--	EC	2 in 25 gal.		
Corn rootworms (Diabrotica longicornis) (D. virgifera) (D. undecimpunctata howardi)	Aldrin	0	--	G, EC, or fertilizer mixture	1-2	Minimum dosage to row or hills when planting; maximum broadcast before planting and immediately work into upper 3-4 in. of soil. Apply diazinon to row only when planting. Apply Compound 4072 to field corn only.	Do not apply heptachlor to soils where hops may be grown, as it may adversely affect the hop plant.
	Compound 4072**	--	--	G	1		
	Diazinon**	0	--	G	1		
	Heptachlor	0	--	G, EC, or fertilizer mixture	1-2		
	Parathion**	1	--	G	1		
	Phorate**	0	--	G	1		
Cutworms and general soil insects	Aldrin	0	--	EC	1-2	Minimum dosage in band over row when planting; maximum broadcast before planting and immediately work into upper 3-4 in. of soil.	
	Heptachlor	0	--	EC	1-2		

*Kernels and kernels plus cob, determined after removing husks present when marketed.

**Use when rootworms have developed resistance to other insecticides.

CROP AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CORN							
European corn borer (Ostrinia nubilalis)	Carbaryl	5 corn* 100 fodder or forage	--	WP G	1.5 1.5	When 3/4 of plants show first-generation larvae feeding in whorl and again 7 days later if needed. Treat for second generation when there are 100 egg masses per 100 plants, or treat fields that are shedding pollen when moths are flying. Seed corn fields should be treated for first brood when 25% of the plants show leaf feeding, and for second brood if the corn is shedding pollen and is still in the green silk stage.	Endrin, EPN, and parathion should be applied only by a trained operator. Do not feed forage, including ensilage, treated with DDT to dairy animals; do not feed forage treated with DDT emulsion or dust to animals being finished for slaughter, or DDT granules to meat animals within 90 days of slaughter. Do not feed forage treated with toxaphene or more than one application of endrin to dairy animals or animals being finished for slaughter.
	DDT	--	--	EC D G	1.5 2 1		
	Endrin	--	45	EC G	0.25 0.25		
	EPN	3	14	G WP	0.2 0.25		
	Toxaphene	7	--	G	1.5 - 2		
Fall armyworm (Spodoptera frugiperda) Larvae in whorl	Carbaryl	5 corn* 100 fodder or forage	--	WP	1.25 in 25 gal.	One or two applications directed into whorls from above.	
	DDT	--	--	EC or G D	1 - 1.5		
	Endrin	--	45	EC	3 - 4 oz.		
	Parathion	1	12	EC	0.25		
	Toxaphene	7	--	EC D	1.5 - 2 2		
Larvae attacking ears	Carbaryl	5 corn* 100 fodder or forage	--	D or WP	1.25	One or two applications when larvae are young, directed at ear zone.	
	DDT	--	--	EC	1.5 - 2		

*Kernels and kernels plus cob, determined after removing husks present when marketed.

GRAIN INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CORN							
Flea beetles	Carbaryl	5 corn* 100 fodder or forage	--	WP	1	When plants are small.	Endrin and parathion should be applied only by a trained operator.
Grasshoppers	Carbaryl	5 corn* 100 fodder or forage	--	WP	0.5 - 1	To hatching areas when nymphs are young.	
	Chlordane	0.3	--	EC	0.75 - 1.5		Do not feed forage, including ensilage, treated with chlordane, endrin, or toxaphene to dairy animals or animals being finished for slaughter.
	Diazinon	0.75 corn* 10 forage	2	EC	0.5 - 0.75		
	Malathion	2 corn* 8 forage	5	EC	1		
	Toxaphene	7	--	EC	1.0 - 1.5		
Japanese beetle (Popillia japonica) Adults	Carbaryl	--	5	WP	0.5	When beetles begin to attack silks.	
	Malathion	--	5	EC	1		
Mormon cricket (Anabrus simplex)	Chlordane	--	--	0.5% B**	10 - 20 B	Spread bait ahead of advancing band of crickets.	Store baits where livestock cannot reach it; do not pile on ground. Keep livestock off air strips where planes are being loaded with bait. Try not to spill bait; clean up any that is spilled.
	Toxaphene	--	--	1% B**	10 - 20 B		
Southwestern corn borer (Zeadiatraea grandiosella)	Endrin	--	--	G	0.5	On foliage when second-generation borers are first observed. Make 3 applications 7 days apart.	
Spider mites	Parathion	1	12	D or EC	0.5	On foliage as needed.	
Sugarcane beetle (Euetheola rugiceps)	Aldrin	0	--	EC or G	1	6 - 8 in. band on top of row when planting.	Do not apply heptachlor to soils where hops may be grown as it may adversely affect the hop plant.
	Heptachlor	0	--	EC or G	1		
Sugarcane borer (Diatraea saccharalis)	Endrin	--	--	G	0.5	On foliage when second- or third-generation borers are first observed. Make 3 applications 10-14 days apart.	

*Kernels and kernels plus cob, determined after removing husks present when marketed.
**Use EC or WP in wet baits or oil solutions in dry baits.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CORN							
White grubs	Aldrin	0	--	EC or G	1.5 - 2	Broadcast 2 - 3 weeks before planting and immediately work into upper 3 - 4 in. of soil.	Do not apply heptachlor to soils where hops may be grown as it may adversely affect the hop plant.
	Heptachlor	0	--	EC or G	1.5 - 2		
Wireworms	Aldrin	0	--	EC or G	1.5 - 2	Broadcast before planting and immediately work into upper 3 - 4 in. of soil.	
	Heptachlor	0	--	EC or G	1.5 - 2		
RICE							
Grape colaspis (Colaspis flavida)	Aldrin	--	--	D or WP	0.5/100 lb. seed	To seed before planting.	Do not use treated seed for food or feed.
	Heptachlor	--	--	D or WP	0.5/100 lb. seed		
Rice water weevil (Lissorhoptrus oryzophilus)	Aldrin	--	--	D or WP	0.25/100 lb. seed		Methyl parathion and phosphamidon should be applied only by a trained operator.
	Heptachlor	--	--	D or WP	0.25/100 lb. seed		
Stink bug (Oebalus pugnax)	Carbaryl	5 grain 100 straw	14	WP	1	About 1 week after heads appear. Two applications may be needed if infestation is severe.	Do not feed straw treated with phosphamidon to dairy animals or animals being finished for slaughter.
	Malathion	8	7	EC	0.75 - 1		
	Methyl parathion	0	15	EC	0.25		
	Phosphamidon	--	21	EC	0.13 - 0.25		
SORGHUM							
Corn earworm (Heliothis zea) on heads from grain	Carbaryl	10 grain 100 forage	21 grain 0 forage	WP	1.5	When larvae are small.	Mevinphos should be applied only by a trained operator.
	Mevinphos	1	3	EC	0.5		Do not apply toxaphene to sorghum more than once after heads begin to form.
Chinch bug (Blissus leucopterus)	Toxaphene	5 grain	28	EC	2	To base of plants where bugs congregate; coat or wet bugs.	Do not feed forage or straw treated with toxaphene to dairy animals or animals being finished for slaughter, or allow such animals to graze on fields treated with toxaphene.

GRAIN INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SORGHUM							
Fall armyworm (Spodoptera frugiperda)	Carbaryl	10 grain 100 forage	21 grain 0 forage	WP	1.5	When larvae are young.	Endrin and mevinphos should be applied only by a trained operator. Do not apply endrin more than once. Do not apply toxaphene to sorghum more than once after heads begin to form. Do not feed forage treated with DDT or toxaphene to dairy animals or animals being finished for slaughter, or allow such animals to graze on fields treated with toxaphene. Do not apply DDT to sorghum after heads begin to form unless heads are being produced for seed.
	DDT	--	--	EC D	1 2		
	Endrin	--	35	EC	3 - 4 oz.		
	Toxaphene	5 grain	28	EC D	1.5 - 2 2		
Larvae in whorl (budworm damage)	Carbaryl	10 grain 100 forage	21 grain 0 forage	WP	1.5	To entire plant before heads appear.	
	DDT	--	--	EC	2		
Grasshoppers	Toxaphene	5	28	EC	1.0 - 1.5	To hatching areas when nymphs are young.	
Sorghum midge (Contarinia sorghicola) on heads for seed	DDT	--	--	D	1.25	On heads as needed.	
Sorghum webworm (Celama sorghicola)	Carbaryl	10 grain 100 forage	21 grain 0 forage	WP	1.5	As soon as infestation is found.	
	Mevinphos	1	3	EC	0.5		
SMALL GRAINS-- Barley, Oats, Wheat, and Rye							
Armyworm (Pseudaletia unipuncta)	Carbaryl	0 grain 100 straw	--	WP	1.5	When larvae are young.	Do not apply carbaryl after boot stage to grain to be used for food; grain forage may be pastured or fed to livestock immediately after treatment. Do not apply DDT after heads begin to form. Do not allow dairy animals or animals being finished for slaughter to graze on fields treated with DDT.
	DDT (except on barley)	--	--	EC	1.5		

Continued

CROP AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SMALL GRAINS--Barley, Oats, Wheat, and Rye							
Armyworm (Pseudaletia unipuncta) (con.)	Parathion (except on rye)	1	15	EC	0.25	When larvae are young.	Demeton, endrin, and parathion should be applied only by a trained operator.
	Toxaphene	5	--	EC	1.5		
Brown wheat mite (Petrobia latens)	Demeton (except on rye)	0.75 grain 5 forage and straw	45 grain 21 forage	EC	0.25	When damage appears.	Do not apply demeton more than twice per season. Allow at least 14 days between applications.
	Parathion (except on rye)	1	15	EC	0.5		Do not apply carbaryl after boot stage to grain to be used for food; grain forage may be pastured or fed to livestock immediately after treatment.
Cereal leaf beetle (Oulema melanopus)	Carbaryl	0 grain 100 straw	--	EC	1	When damage by adults appears, or when larvae are young.	
	Malathion	8	7	EC	1		
Corn leaf aphid (Rhopalosiphum maidis)	Parathion (except on rye)	1	15	EC	0.25	On foliage as needed.	
Cutworms	DDT	--	--	EC	1.5	When larvae are young.	Do not apply DDT after heads begin to form.
	Endrin	--	45	EC	3 - 4 oz.		Do not apply endrin more than once.
	Toxaphene	5	14 barley 7 others	EC	1.5		
Fall armyworm (Spodoptera frugiperda)	DDT (except on barley)	--	--	EC D	1 2		Do not allow dairy animals or animals being finished for slaughter to graze on fields treated with DDT or toxaphene.
	Endrin	--	45	EC	3 - 4 oz.		
	Parathion (except on rye)	1	15	EC	0.25		
	Toxaphene	5	--	EC D	1.5 - 2 2		

GRAIN INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SMALL GRAINS--Barley, Oats, Wheat, and Rye							
Grasshoppers	Chlordane	--	--	EC	0.75 - 1.5	To hatching areas when nymphs are young.	Demeton, methyl parathion, parathion, and phosphamidon should be applied only by a trained operator.
	Malathion	8	7	EC	1		
	Toxaphene	5	--	EC	1.0 - 1.5		
Greenbug (Schizaphis graminum)	Demeton (except on rye)	0.75 grain 5 forage and straw	45 grain 21 forage	EC	0.25	When temperature is 50° F. or above.	Do not apply chlordane after heads begin to form. Do not allow grazing on fields treated with chlordane.
	Methyl parathion	0	15	EC	0.25		
	Parathion (except on rye)	1	15	EC	0.25		Do not allow dairy animals or animals being finished for slaughter to graze on fields treated with toxaphene.
	Phosphamidon*	--	30	EC	0.25 - 0.5		
Mormon cricket (Anabrus simplex)	Chlordane	--	--	0.5% B**	10 - 20 B	Spread bait ahead of advancing band of crickets.	Do not apply demeton more than twice per season. Allow at least 14 days between applications.
	Toxaphene	5	14 barley 7 others	1% B**	10 - 20 B		
Red harvester ant (Pogonomyrmex barbatus)	Carbon disulfide	--	--	Fumigant	4 fl. oz./colony	Pour into entrance hole of nest.	Store bait where livestock cannot reach it; do not pile on ground. Keep livestock off airstrips where planes are being loaded with bait. Try not to spill bait; clean up any that is spilled.
	Chlordane	--	--	5% D	0.5/colony	Spread thinly in 4 - 6 in. band in circle 5 - 6 ft. in diameter around nest entrance.	
Winter grain mite (Penthaleus major)	Malathion	8	7	EC	0.6	Apply as soon as injury appears.	
	Parathion (except on rye)	1	15	EC	0.25 - 0.5 (Maximum for airplane application)		

*Recommended for use on wheat only.
**Use EC or WP in wet bait or oil solution in dry bait.

CROP AND INSECTICIDE	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
ALFALFA							
Alfalfa caterpillar (Colias eurytheme)	Carbaryl	100	--	WP	1	If there are 10 or more caterpillars per sweep of net, usually when alfalfa is 1/3 grown.	Azinphosmethyl, mevinphos, and parathion should be applied only by a trained operator. Do not apply azinphosmethyl or trichlorfon more than once per cutting. Treat alfalfa in bloom only when bees and other pollinators are not visiting plants.
	Methoxychlor	100	7	EC	0.75 - 1		
	Mevinphos	1	1	EC	2 oz.		
	Trichlorfon	--	14	Soluble powder	4 - 5 oz.		
	Bacillus thuringiensis	Exempt	--	WP 25 - 75 billion spores/gm.	6 oz. WP	Apply by aircraft only.	
Alfalfa weevil (Hypera postica)	Azinphosmethyl	2 fresh forage 5 hay	21	EC	0.5	In spring when most of the tips are beginning to show feeding. A second application may be necessary. If harvest infestation is severe, treat stubble as soon as crop is removed.	
	Diazinon	40 fresh alfalfa 10 hay	4 grazing 10 cutting for hay	EC	1		
	Malathion	135	--	EC	1 - 1.25		
	Methoxychlor	100	7	EC	1 - 1.5		
	Parathion	1	15	EC	0.25		
Clover leaf weevil (Hypera punctata)	Malathion	135	--	EC	1	In spring when alfalfa is 2 - 6 in. tall.	
	Methoxychlor	100	7	EC	1		
Cutworms	Mevinphos	1	1	EC	6 oz.	In evening when worms are active.	
	Parathion	1	15	EC	6 oz.		
	Trichlorfon	--	14	Soluble powder	1		
Grasshoppers	Carbaryl	100	--	Sprayable	0.75 - 1	After cutting and before plants are 6 in. tall. A second application may be necessary.	
	Diazinon	40 fresh alfalfa 10 hay	4 grazing 10 cutting for hay	EC	0.5		
	Malathion	135	--	EC	1		
	Mevinphos	1	1	EC	0.25 - 0.5		
	Naled	--	4	EC	0.75		

LEGUME AND GRASS INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
ALFALFA							
Lygus bugs (Lygus spp.), leafhoppers, and thrips							Demeton, mevinphos, parathion, and tepp should be applied only by a trained operator. Do not feed plants treated with DDT or toxaphene, or ensilage made from treated plants, to poultry, dairy animals, or animals being finished for slaughter. Do not apply DDT to forage to be sold commercially or shipped interstate. Do not apply trichlorfon or demeton more than once per cutting. Treat alfalfa in bloom only when bees and other pollinators are not visiting plants.
On seed crop in West	DDT	--	--	D EC	2 1.5 - 2	As soon as buds appear.	
				EC	0.5	During bloom.	
	Malathion	135	--	EC	1		
	Trichlorfon	--	14	Soluble powder	1		
	Toxaphene	--	--	D EC	2 1.5	During bloom 3 - 4 weeks after bud treatment.	
Meadow spittlebug (Philaenus spumarius)							
Spring treatment	Methoxychlor	100	7	EC	1	Within week after eggs begin to hatch.	
Fall treatment	Methoxychlor	100	7	EC	1.5	In early September.	
Pea aphid (Acyrthosiphon pisum)							
On hay or seed crop	Demeton	5 fresh forage 12 hay	21	EC	0.25	Before bloom or in evening during bloom.	
	Diazinon	40 fresh alfalfa 10 hay	4 grazing 10 cutting for hay	EC	0.5		
	Malathion	135	--	EC	0.6 - 1.0		
	Mevinphos	1	1	EC	2 oz.		
	Naled	--	4	EC	1		
	Parathion	1	15	EC	0.25		
	Tepp	--	3	EC	0.5		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
ALFALFA							
Potato leafhopper (Empoasca fabae)	Carbaryl	100	--	WP	1	When alfalfa is about half grown or earlier if insects become abundant.	Demeton, mevinphos, and parathion should be applied only by a trained operator.
	Malathion	135	--	EC	0.75		
	Methoxychlor	100	7	EC	0.5		
Red harvester ant (Pogonomyrmex barbatus)	Carbon disulfide	--	--	Fumigant	4 fl. oz./colony	Pour into entrance hole of nest.	Carbon disulfide should be applied by a person thoroughly familiar with its hazards. Do not feed plants treated with chlordane, DDT, or toxaphene, or ensilage made from treated plants to poultry, dairy animals, or animals being finished for slaughter.
	Chlordane	--	--	5% D	0.5 lb. D/colony	Spread thinly in 4 - 6 in. band in circle 5 - 6 ft. in diameter around nest entrance.	
Spider mites	Demeton	5 fresh forage 12 hay	21	EC	0.25	Before plants bloom.	
Spotted alfalfa aphid (Therioaphis maculata)	Demeton	5 fresh forage 12 hay	21	EC	0.25	To seedlings when 1/2 - 1 aphid per plant, and to older stands when 5 aphids per leaf and honeydew are found.	Do not apply demeton or trichlorfon more than once per cutting.
	Diazinon	40 fresh alfalfa 10 hay	4 grazing 10 cutting for hay	EC	0.5		
	Malathion	135	--	EC	10 oz.		Treat alfalfa in bloom only when bees and other pollinators are not visiting plants.
	Mevinphos	1	1	EC	2 oz.		
	Parathion	1	15	EC	0.25		
Thrips (See Lygus bugs)							
Webworms (Loxostege spp.)	Trichlorfon	--	14	Soluble powder	0.25	When worms are present in damaging numbers.	
Western yellow-striped armyworm (Prodenia praefica) On seed crop	DDT	--	--	D or EC	1.5	When feeding on flower racemes.	Do not apply DDT to forage to be sold commercially or shipped interstate.
	Malathion	135	--	EC	1		
	Toxaphene	--	--	D or EC	2		
	Trichlorfon	--	14	Soluble powder	1		

LEGUME AND GRASS INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CLOVER							Mevinphos should be applied only by a trained operator. Do not feed plants treated with DDT, or ensilage made from treated plants to poultry, dairy animals, or animals being finished for slaughter. Do not apply DDT to forage to be sold commercially or shipped interstate. Treat clover in bloom only when bees and other pollinators are not visiting plants.
Clover leaf weevil (Hypera punctata)	Malathion	135	--	EC	1	In spring when clover is 2 - 6 in. tall.	
	Methoxychlor	100	7	EC	1		
Clover seed weevil (Miccotragus picirostris) On seed crop	DDT	--	--	D or EC	1	When 2% of heads are withered and brown.	
Grasshoppers	Carbaryl	100	--	Sprayable	0.75 - 1	When grasshoppers are young. A second application may be necessary.	
	Malathion	135	--	EC	1		
	Mevinphos	1	1	EC	0.25 - 0.5		
	Naled	--	4	EC	0.75		
Meadow spittlebug (Philaenus spumarius) Spring treatment	Methoxychlor	100	7	EC	1	Within week after eggs begin to hatch.	
Fall treatment	Methoxychlor	100	7	EC	1.5	In early September.	
GRASS -- Range and Pasture							Mevinphos and parathion should be applied only by a trained operator. Do not apply mevinphos to grass to be cut for hay to be shipped interstate. Do not treat pasture with toxaphene more than once per season. Do not graze dairy animals in treated fields. Do not graze meat animals in treated fields within 6 weeks of slaughter. Toxaphene should not be used near lakes, ponds, or streams. Do not apply toxaphene to forage to be sold commercially or shipped interstate.
Armyworm (Pseudaletia unipuncta) and fall armyworm (Spodoptera frugiperda)	Parathion	1	15	EC	0.25	When larvae are small.	
	Toxaphene	--	--	EC	1.5 - 2		
Grasshoppers	Carbaryl	100	--	Sprayable	0.5 - 1	When hatching of dominant species is completed and before eggs are laid.	
	Malathion	135	--	EC or oil soln.	1		
	Mevinphos	--	1	EC	0.25 - 0.5		
	Toxaphene	--	--	EC or oil soln.	1 - 1.5		

LEGUME AND GRASS INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRASS -- Range and Pasture							
Mormon cricket (Anabrus simplex)	Chlordane	--	--	0.5% B*	10 - 20 B	Spread bait ahead of advancing band of crickets.	Spread bait where livestock cannot reach it; do not pile on ground. Keep livestock off air strips where planes are being loaded with bait. Try not to spill bait; clean up any that is spilled. Do not graze dairy animals on grass treated with chlordane or toxaphene baits. Do not graze animals being finished for slaughter on areas baited with chlordane. Do not graze meat animals in fields baited with toxaphene within 6 weeks of slaughter. Toxaphene should not be used near lakes, streams, or ponds. Do not apply toxaphene more than once per season.
	Toxaphene	--	--	1% B*	10 - 20 B		
GRASS -- Wastelands, Roadsides, and Conservation Reserve Lands, not Grazed							
Grasshoppers	Carbaryl	100	--	Sprayable	0.5 - 1	After hatching and before movement to crops takes place.	Toxaphene should not be used near lakes, streams, or ponds.
	Malathion	135	--	EC or oil soln.	1 - 2		
	Toxaphene	--	--	EC or oil soln.	1 - 1.5		

*Use EC or WP in wet bait or oil solution in dry bait.

LEGUME AND GRASS INSECTS

CROP AND INSECTICIDE	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRASS -- Lawn and Turf Areas, not Grazed					Per 1,000 sq. ft.		Do not apply insecticides to lawns or other turf areas when people or animals are on them, and do not allow insecticides to drift to areas where they might injure people or animals or contaminate food or feed. Keep children and pets off treated lawns and other turf areas until the insecticide has been washed off by sprinkling, and the grass has completely dried.
Ants	Aldrin	--	--	EC, WP, D, or G	1 oz.	To entire area or to individual nests. Sprinkle after application.	
	Chlordane	--	--	EC, WP, D, or G	4 oz.		
	Dieldrin	--	--	EC, WP, D, or G	1 oz.		
	Heptachlor	--	--	EC, WP, D, or G	1 oz.		
Armyworms (Pseudaletia unipuncta) and fall armyworms (Spodoptera frugiperda)					Per 1,000 sq. ft.		
	Chlordane	--	--	EC, WP, D, or G	2 oz.	As soon as infestation appears and while worms are small.	
	Dieldrin	--	--	EC, WP, D, or G	1 oz.		
	Heptachlor	--	--	EC, WP, D, or G	1 oz.		
Billbugs (Sphenophorus spp.)					Per 1,000 sq. ft.		
	Chlordane	--	--	EC, WP, D, or G	0.5	When damage is observed.	
	Diazinon	--	--	EC or G	3 oz.		
	Nemacide	--	--	EC	9 oz.		
Cicada-killer (Sphecius speciosus) and wild bees					Per 1,000 sq. ft.		
	Chlordane	--	--	EC, WP, D, or G	2 oz.	In late July and August when nests are numerous.	
	DDT	--	--	EC, WP, D, or G	2 oz.		
Chinch bugs (Blissus spp.) and false chinch bug (Nysius ericae)					Per 1,000 sq. ft.		
	Carbaryl	--	--	WP	4 oz.	To lawns or other turf areas as soon as damage occurs. A second application may be needed in 7 - 10 days.	
	Chlordane	--	--	EC, WP, or G	4 oz.		
	DDT	--	--	EC, WP, or G	4 oz.		
	Diazinon*	--	--	EC or WP	3 oz.		
	Dieldrin	--	--	EC, WP, D, or G	1 oz.		
	Nemacide*	--	--	EC	9 oz.		

*Use when chinch bugs have developed resistance to other insecticides.

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LEGUME AND GRASS INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRASS -- Lawns and Turf Areas, not Grazed					Per 1,000 sq. ft.		Do not apply insecticides to lawns or other turf areas when people or animals are on them, and do not allow insecticides to drift to areas where they might injure people or animals or contaminate food or feed. Keep children and pets off treated lawns or other turf areas until the insecticide has been washed off by sprinkling, and the grass has completely dried.
Cutworms	Chlordane	--	--	EC, WP, D, or G	2 oz.	In late afternoon.	
	Dieldrin	--	--	EC, WP, D, or G	1 oz.		
	Heptachlor	--	--	EC, WP, D, or G	1 oz.		
European chafer (Amphimallon majalis) and masked chafers (Cyclocephala spp.) Grubs					Per 1,000 sq. ft.		
	Aldrin	--	--	EC, WP, D, or G	1 oz.	Apply when ground is not frozen. Sprinkle lightly after application.	
	Chlordane	--	--	EC, WP, D, or G	4 oz.		
	Dieldrin	--	--	EC, WP, D, or G	1 oz.		
	Heptachlor	--	--	EC, WP, D, or G	1 oz.		
Green June beetle (Cotinus nitida) Grubs					Per 1,000 sq. ft.		
	Aldrin	--	--	EC, WP, D, or G	1 oz.	In mid and late summer when grubs are young. Water after application.	
	Dieldrin	--	--	EC, WP, D, or G	1 oz.		
	Heptachlor	--	--	EC, WP, D, or G	1 oz.		
Japanese beetle (Popillia japonica) Grubs					Per 1,000 sq. ft.		
	Aldrin	--	--	EC, WP, D, or G	1 oz.	When examination of turf shows grubs are present. Apply when ground is not frozen and wash into soil.	
	Chlordane	--	--	EC, WP, D, or G	4 oz.		
	DDT	--	--	EC, WP, D, or G	9 oz.		
	Dieldrin	--	--	EC, WP, D, or G	1 oz.		
	Heptachlor	--	--	EC, WP, D, or G	1 oz.		
	Toxaphene	--	--	EC, WP, D, or G	9 oz.		
	Milky disease spores	--	--	D 100 million spores per gram	Per 1,000 sq. ft. 8 oz. spore D broadcast 2 gm. spore D per spot at 3, 5, or 10 ft. intervals.	To permanent turf when grub population is less than 10 per square foot. Mix dosage with several times its volume of sand, soil, or fertilizer.	Do not apply spore dust and chemical insecticide to same turf.

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GRASS -- Lawns and Turf Areas, not Grazed					Per 1,000 sq. ft.		Do not apply insecticides to lawns or other turf areas when people or animals are on them, and do not allow insecticides to drift to areas where they might injure people or animals or contaminate food or feed. Keep children and pets off treated lawns or other turf areas until the insecticide has been washed off by sprinkling, and the grass has completely dried.
Leafhoppers	DDT	--	--	EC, WP, or D	0.75 oz.	When insects are abundant	
	Malathion	--	--	EC, WP, or D	0.75 oz.		
Mole crickets					Per 1,000 sq. ft.		
	Chlordane	--	--	EC, WP, D, or G	2 oz.	As soon as damage occurs.	
	Dieldrin	--	--	EC, WP, D, or G	1 oz.		
	Heptachlor	--	--	EC, WP, D, or G	1 oz.		
Sod webworms (Crambus spp.)					Per 1,000 sq. ft.		
	Aldrin	--	--	EC, WP, or D	1 oz.	In late afternoon or evening. A second application may be necessary.	
	Carbaryl	--	--	WP	4 oz.		
	Chlordane	--	--	EC, WP, D, or G	2 oz.		
	DDT	--	--	EC, WP, or D	2 oz.		
	Diazinon	--	--	EC or WP	4 oz.		
	Dieldrin	--	--	EC, WP, D, or G	1 oz.		
	Heptachlor	--	--	EC, WP, D, or G	1 oz.		
	Toxaphene	--	--	EC, WP, or G	2 oz.		
White grubs					Per 1,000 sq. ft.		
	Aldrin	--	--	EC, WP, D, or G	1 oz.	When examination of turf shows grubs are present. Preferably in late summer and early fall when grubs are small. Water lightly after application.	
	Chlordane	--	--	EC, WP, D, or G	4 oz.		
	Dieldrin	--	--	EC, WP, D, or G	1 oz.		
	Heptachlor	--	--	EC, WP, D, or G	1 oz.		
Wireworms					Per 1,000 sq. ft.		
	Chlordane	--	--	EC, WP, D, or G	2 oz.	When damage is noted and worms are present.	
	Dieldrin	--	--	EC, WP, D, or G	1 oz.		
	Heptachlor	--	--	EC, WP, D, or G	1 oz.		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
PEANUTS							
Corn earworm (Heliothis zea)	Carbaryl	5 peanuts 100 hay	--	D or WP	0.75 - 1	When larvae are young.	Parathion and phorate should be applied only by a trained operator.
	DDT	7 peanuts	--	D	0.75		
Cutworms	DDT	7 peanuts	--	D or EC	1.5 - 2	As soon as damage is noted.	Do not feed plants treated with DDT or toxaphene, or ensilage made from treated plants to poultry, dairy animals, or animals being finished for slaughter.
	Toxaphene	7 peanuts	--	D or EC	1.5 - 2		
Fall armyworm (Spodoptera frugiperda)	Carbaryl	5 peanuts 100 hay	--	D or WP	0.75	When larvae are young.	
	Parathion	1 peanuts	15	EC	0.25		
	Toxaphene	7 peanuts	--	D or EC	2		
Potato leafhopper (Empoasca fabae)	Carbaryl	5 peanuts 100 hay	--	D or WP	1	About July 10, and then at 3-week intervals.	
	DDT	7 peanuts	--	D or EC	0.5		
	Malathion	8 peanuts 0 hay	30	D or EC	1		
Southern corn rootworm (Diabrotica undecimpunctata howardi)	Diazinon	--	--	EC or G	3	To row just prior to pegging and immediately work into upper 3-4 in. of soil.	
Thrips	DDT	7 peanuts	--	D or EC	0.75	As soon as injury appears and again 10 days later.	
	Phorate	--	--	G	1	In furrow at planting time.	Do not graze livestock on immature peanut plants after phorate treatment.
Velvetbean caterpillar (Anticarsia gemmatalis)	Carbaryl	5 peanuts 100 hay	--	WP	1	A few days after eggs hatch or as soon as feeding is noted.	
	DDT	7 peanuts	--	D	0.5 - 1		
	Methoxychlor	14 peanuts 100 forage	7	D	1		
	Toxaphene	7 peanuts	--	D	1.5		

LEGUME AND GRASS INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
PEANUTS							
White-fringed beetles (Graphognathus spp.)	DDT	7 peanuts	--	D, EC, G, or WP	Broadcast 10 Row 2 - 3	Broadcast when preparing soil for planting and immediately work into upper 3 in., or apply insecticide alone or mixed with fertilizer in row at time of planting.	Do not feed plants treated with DDT, or ensilage made from treated plants, to poultry, dairy animals, or animals being finished for slaughter.
SOYBEANS							
Corn earworm (Heliothis zea)	Carbaryl	100 forage 5 beans	--	D or WP	1.5	When blossoms fall.	Carbophenothion should be applied only by a trained operator. Do not feed forage treated with carbophenothion to livestock.
Green cloverworm (Pathypena seabra)	Carbaryl	100 forage 5 beans	--	D or WP	1.5	When larvae are small and number 5 - 10 per foot of row.	
Mexican bean beetle (Epilachna varivestris)	Carbaryl	100 forage 5 beans	--	WP	1	To under surface of leaves when beetles appear.	
	Malathion	--	1	D, EC, or WP	1		
	Methoxychlor	100 forage	7	D or WP	1.5		
Mites	Carbophenothion	0.8 beans	7	EC or WP	0.75	To field borders when mites move in or to entire field when infestation is general.	
Velvetbean caterpillar (Anticarsia gemmatalis)	Carbaryl	100 forage 5 beans	--	D or WP	1.25	A few days after eggs hatch or as soon as feeding by larvae is noted.	
	Methoxychlor	100 forage	7	D	1		
VETCH (Seed Crop)							
Vetch bruchid (Bruchus brachialis)	DDT	--	--	D or EC	0.75	As soon as pods appear.	Do not feed plants treated with DDT, or ensilage made from treated plants, to poultry, dairy animals, or animals being finished for slaughter.
	Malathion	--	7	EC	1		
	Methoxychlor	--	7	EC	1		
	Naled	--	4	EC	1		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SUGARBEET, SEED CROP							
Aphids on foliage	Benzene hexachloride	--	--	D or EC	0.5 (gamma isomer)	On foliage when aphids appear.	Parathion and phorate should be applied only by a trained operator.
	Endosulfan	--	--	D or EC	1		
Beet leafhopper (Circulifer tenellus)	DDT	--	--	D, EC, or WP	2	On foliage of young plants.	When benzene hexachloride, DDT, endosulfan, or toxaphene are used, do not feed seed or seed refuse to livestock or poultry.
	Parathion	--	15	D or EC	0.5		
	Phorate	--	--	44% in carbon D	3 lb./100 lb. seed	Mix dry with whole seed. Not practical on processed seed without the use of a sticker.	
Lygus bugs	Benzene hexachloride	--	--	D or EC	0.5 (gamma isomer)	On foliage of plants in soft-seed stage.	
	Naled	--	5	EC	1		
	Parathion	--	15	D or EC	0.5		
	Toxaphene	--	--	D, EC, or WP	3		
Stink bugs	Parathion	--	15	D, EC, or WP	0.5	On foliage of plants in seed stage.	
	Toxaphene	--	--	D, EC, or WP	6		
SUGARBEET, SUGAR CROP							
Alfalfa looper (Autographa californica)	Carbaryl	100 tops	14	D or WP	1.0	Treat infested areas when loopers appear.	Demeton, disulfoton, and parathion should be applied only by a trained operator. Do not apply demeton more than 3 times during the season.
	Parathion	--	15	D, EC, or WP	0.5		
	Trichlorfon	--	28*	Soluble powder	1.5		
Aphids on foliage	Demeton	5 tops 0.5 roots	30	EC	0.5	On foliage when aphids appear.	
	Disulfoton	2 tops 0.5 roots	30	G	1		

Continued

*14 days if tops are not to be fed to livestock.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SUGARBEET, SUGAR CROP							
Aphids on foliage (con.)	Parathion	--	15	D, EC, or WP	0.5	On foliage when aphids appear.	Parathion, phosphamidon, and tepp should be applied only by a trained operator. After applying parathion to soil, keep all persons and animals off treated area for 48 hours.
	Phosphamidon	--	30	EC	1		
	Tepp	0	3	EC	0.4		
Armyworms	Parathion	--	15	D	0.5	On foliage of young plants.	
	Trichlorfon	--	28*	Soluble powder	1.5		
Blister beetles	Carbaryl	100 tops	14	WP	1	On foliage as needed.	
	Parathion	--	15	D, EC, or WP	0.5		
Cutworms	Phosphamidon	--	30	EC	1		
	Trichlorfon	--	28*	Soluble powder	1.5		
Flea beetles	Carbaryl	100 tops	14	WP	2		
	Parathion	--	15	D, EC, or WP	0.5		
Garden symphylan (Scutigerella immaculata)	Parathion	--	--	EC, G, or WP	5	Broadcast on soil surface before planting and thoroughly work into upper 6 in.	
Grasshoppers	Carbaryl	100 tops	14	WP	1	On foliage and soil as needed.	
	Malathion	--	7	EC or WP	2		
Leaf miners	Parathion	--	15	D, EC, or WP	0.5	On foliage as needed. Repeat in 10 days.	
	Trichlorfon	--	28*	Soluble powder	1		
Lygus bugs	Naled	--	5	EC	1	On foliage as needed.	
	Parathion	--	15	D or EC	0.5		
	Trichlorfon	--	28*	Soluble powder	1		

*14 days if tops are not to be fed to livestock.

CROP AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SUGARBEET, SUGAR CROP							Carbophenothion, dichloropropane-dichloropropene mixture, parathion, phosphamidon, and Telone should be applied only by a trained operator. After applying parathion to soil, keep all persons and animals off treated area for 48 hours.
Spider mites (Tetranychus spp.)	Carbophenothion	5	14	D, EC, or WP	1	On foliage as needed.	
	Sulfur	Safe	--	D	30		
Webworms	Parathion	--	15	D, EC, or WP	0.5	On foliage when insects appear.	
	Phosphamidon	--	30	EC	1		
	Trichlorfon	--	28*	Soluble powder	1.5		
Wireworms	Diazinon	0.75 roots 10 tops	--	G	3-4	Broadcast granules on soil and immediately work thoroughly into upper 6-9 inches. Soil temperature must be at least 50° F.	
	Parathion	--	--	G	4		
	Dichloropropane-dichloropropene mixture	--	--	Fumigant	250	Inject 8 in. deep into fallow soil every 12 in. at least 3 weeks before planting. Soil temperature at 6-inch depth must be between 45° and 90° F. Do not apply dichloropropane-dichloropropene mixture or Telone to extremely heavy or soil when very wet or very dry.	
	Telone	--	--	Fumigant	250		

*14 days if tops are not to be fed to livestock.

SUGARBEET AND SUGARCANE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SUGARCANE							
Armyworm (Pseudaletia unipuncta) and fall armyworm (Spodoptera frugiperda)	Toxaphene	--	--	EC D	2 2	When larvae are young.	Azinphosmethyl and endrin should be applied only by a trained operator. Azinphosmethyl or endosulfan should not be applied more than 4 times, and endrin not more than 3 times per season. Do not graze livestock on fields treated with azinphosmethyl, endosulfan, or endrin, or feed bagasse or tops from such treated fields to livestock. Cane treated with azinphosmethyl must be burned off at harvest or washed before processing.
Sugarcane borer (Diatraea saccharalis)	Azinphosmethyl Carbaryl Endosulfan Endrin	-- -- -- --	40 30 60 45	G G G G	1.1 3 0.5 0.33	At 3-week intervals starting after joints begin to form and when 5% of the plants are infested with young larvae which have not yet bored into stalks.	
Wireworms	Chlordane	--	--	EC	2	On cane seed pieces in open furrow at time of planting.	
Small soil arthropods	Chlordane	--	--	EC	2		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
PLANT BED AND NEWLY SET PLANTS							
Aphids, green peach (Myzus persicae)	Endosulfan	--	--	D or EC	1.5	On foliage as needed. Use maximum dosage in plant bed.	Azinphosmethyl or parathion should be applied only by a trained operator. When workers must handle tobacco within 5 days after application of azinphosmethyl or parathion, they should be protected against skin contact by wearing clean, dry, cotton gloves and tightly woven clothing.
	Malathion	--	--	EC	1.5		
	Parathion	--	--	D, EC, or WP	0.5		
Budworms (Heliothis spp.)				Baits		To buds of plants as soon as eggs and small worms appear.	
	Bacillus thuringiensis	--	--	1 lb. WP*/19 lb. cornmeal	10 B		
	DDT	--	--	2 lb. 50% WP/75 lb. cornmeal	10 B		
	TDE	--	--	2 lb. 50% WP/75 lb. cornmeal	10 B		
	DDT	--	--	D or EC	1		
	Endosulfan	--	--	D or EC	0.5		
	TDE	--	--	D or EC	1		
Cutworms	DDT	--	--	D, EC, or WP	1.5	To transplants and adjacent soil surface when plants are dry.	
Flea beetles	Azinphosmethyl	--	--	D or EC	0.2	On foliage as needed.	
	DDT	--	--	D, EC, or WP	1		
Grasshoppers	Malathion	--	--	EC	1	To plant bed and soil around margin of bed. Treat field borders and nearby vegetation preferably when grasshoppers are immature.	Nearby vegetation treated with malathion should not be harvested or fed to livestock within 7 days.
Green June beetle (Cotinis nitida) larvae	Carbaryl	--	--	0.5 lb. 50% WP per 50 gal.	100 gal. drench per 100 sq. yd.	To uprooted areas of plant beds with sprinkling can.	
	Diazinon	--	--	0.25 lb. 50% WP per 50 gal.			

Continued

*Bacillus thuringiensis as wettable powder containing 25 billion spores per gram.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
PLANT BED AND NEWLY SET PLANTS							
Green June beetle (Cotinis nitida) larvae (con.)	Endosulfan	--	--	0.5 lb. 25% WP per 50 gal.	100 gal. drench per 100 sq. yd.	To uprooted areas of plant beds with sprinkling can.	Azinphosmethyl or parathion should be applied only by a trained operator.
	Trichlorfon	--	--	0.5 lb. 50% soluble powder per 50 gal.			
Hornworms (Manduca spp.)	Bacillus thuringiensis	--	--	3% aqueous suspension concentrate	1 qt. concentrate	To foliage as needed.	When workers must handle tobacco within 5 days after application of azinphosmethyl or parathion, they should be protected against skin contact by wearing clean, dry, cotton gloves and tightly woven clothing.
				25 billion spores per gm. WP	2 lb. WP		
	Endosulfan	--	--	D or EC	0.5		
	Azinphosmethyl	--	--	D or EC	0.5		
	TDE	--	--	EC	1		
	TDE + parathion	--	--	D	1 + 0.1		
Mole crickets	Chlordane	--	--	1.5% B	6 oz. B/100 sq.yd.	To plant bed.	
	Parathion	--	--	Drench: 0.5 lb. 15% WP/50 gal.	50 gal. drench per 100 sq. yd.	To uprooted area with sprinkling can.	
Vegetable weevil (Listroderes costirostris obliquus)	DDT	--	--	D	2	To infested plants.	
	Parathion	--	--	D	0.5		
Wireworms Setting-water treatments	Diazinon	--	--	50% WP	1.5 oz. WP/50 gal. water with hand transplanter. 2-3 oz. WP/50 gal. water with mechanical transplanter.	Around stem as plant is transplanted. Use 250 gal./acre and see that soil is wet to surface. Keep well stirred.	

Continued

CROP AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
PLANT BED AND NEWLY SET PLANTS							
Wireworms (con.) Soil treatments	Diazinon	--	--	EC or G	2	Broadcast on soil at least 3 weeks before planting; work into top 6 - 9 in.	
ESTABLISHED PLANTS IN FIELD							
Aphid, green peach (Myzus persicae)	Malathion	--	--	D or EC	1.5	On foliage as needed.	Azinphosmethyl or parathion should be applied only by a trained operator. When workers must handle tobacco within 5 days after application of azinphosmethyl or parathion, they should be protected against skin contact by wearing clean, dry, cotton gloves and tightly woven clothing. Nearby vegetation treated with malathion should not be harvested or fed to livestock within 7 days.
	Parathion	--	5 primings 15 cuttings	D, EC, or WP	0.5		
Budworms (Heliothis spp.)	Bacillus thuringiensis	--	--	Bait 1 lb. WP*/19 lb. cornmeal	10 B	To buds of plants as soon as eggs and small worms appear.	
Flea beetles	Azinphosmethyl	--	6	D or EC	0.4	On foliage as needed.	
Grasshoppers	Malathion	--	--	EC	1.5	Treat field borders and nearby vegetation, preferably when grasshoppers are immature.	
Hornworms (Manduca spp.)	Bacillus thuringiensis	--	--	3% aqueous suspension concentrate	1 qt.	To foliage as needed.	
				25 billion spores per gm. WP	2 lb. WP		
	Azinphosmethyl	--	6	D or EC	0.75		
Tobacco suckfly (Cyrtopeltis notatus)	Parathion	--	5 primings 15 cuttings	D or WP	0.2	To infested plants.	

*Bacillus thuringiensis as wettable powder containing 25 billion spores per gram.

Do not feed vegetation under trees that have been treated with insecticides to dairy animals or animals being finished for slaughter. Remove grazing animals from groves during spraying or dusting operations and keep them out until residues decline to a safe level.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
CHESTNUT								
Mites	Dicofol	5	14	EC or WP	0.37	3.75	When mites appear in numbers, and 7-10 days later.	Do not apply insecticides without tolerances after shucks begin to open.
	Malathion	--	--	WP	0.5	5		
Weevils	DDT	--	--	WP	2	20	3 times 1 week apart, beginning about August 15.	Do not graze livestock in treated groves.
PECAN								
Aphids, black pecan (Myzocallis caryaefoliae) and others	Azinphosmethyl	--	--	WP	0.5	5	When yellow spots appear on foliage.	Do not use azinphosmethyl, carbophenothion, demeton, EPN, parathion, or tepp in small home plantings; should be applied only by a trained operator.
	Carbophenothion	--	--	EC	0.25	2.5		
	Demeton	0.75	21	EC	0.1	1**		
	Endosulfan	--	--	EC or WP	0.75	7.5		
	EPN	0.5	21	WP	0.37	3.75		Do not apply insecticides without tolerances after shucks begin to open.
	Malathion	8	0	EC	--	1.25*		
				WP	0.5	5		Do not graze livestock in treated groves.
	Parathion	--	--	WP	0.3	3		
				D	--	0.5		
				EC	--	1*		
	Tepp	0	3	EC	--	0.5*		

*Apply by airplane.

**If applied by airplane, use only 0.5 lb. per acre.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PECAN								
Curculios (Curculio aratus) and (C. pecanae)	Benezene hexachloride	--	--	WP	0.4 (gamma)	4	Shortly after buds begin to unfold.	Do not use azinphosmethyl, EPN, or parathion in small home plantings; should be applied only by a trained operator. Do not apply insecticides without tolerances after shucks begin to open. Do not graze livestock in treated groves.
		--	--	WP	0.4 (gamma)	4	When buds show $\frac{1}{4}$ -1 inch green.	
	Lindane	--	--	WP	0.37	3.75		
Fall webworm (Hyphantria cunea)	Azinphosmethyl	--	--	WP	0.5	5	When webs become numerous and caterpillars are still small.	
	DDT	--	--	WP	1	10		
	EPN	0.5	21	WP	0.37	3.75		
	Parathion	--	--	WP	0.3	3		
				EC	--	1*		
Hickory shuckworm (Laspeyresia caryana)	Azinphosmethyl	--	--	WP	0.5	5	3 times 2 weeks apart beginning August 10 - 15.	
	EPN	0.5	21	WP	0.37	3.75		
Leaf miner (Nepticula sp.)	Azinphosmethyl	--	--	WP	0.3	3	When leaf miners appear and repeat as additional generations occur.	
	Parathion	--	--	WP	0.3	3		
May beetles (Phyllophaga spp.)	Azinphosmethyl	--	--	WP	0.5	5	In spring when beetles are first noticed.	
	DDT	--	--	WP	1	10		

Continued

*Apply by airplane.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PECAN								
May beetles (Phyllophaga spp.) (con.)	EPN	0.5	21	WP	0.37	3.75	In spring when beetles are first noticed.	Do not use azinphosmethyl, demeton, EPN, or parathion in small home plantings; should be applied only by a trained operator. Do not apply insecticides without tolerances after shucks begin to open. Do not use more than 2% mineral oil on weak trees.
	Parathion	--	--	WP	0.3	3		
Mite (Eotetranychus hicoriae)	Azinphosmethyl	--	--	WP	0.5	5	When mites appear in numbers; if infestation is heavy, repeat in 10 days.	
	Demeton	0.75	21	EC	0.1	1		
	Dicofol	5	14	EC or WP	0.37	3.75		
	EPN	0.5	21	WP	0.37	3.75		
	Malathion	8	0	EC	0.62	6.25		
	Parathion	--	--	WP	0.3	3		
				EC	--	1*		
Mites (Brevipalpus spp.)	Sulfur	Safe	--	WP	4	40	In May or June and in July or August as needed.	
Obscure scale (Melanaspis obscura)	Mineral oil	Exempt	--	EC or emulsion	2 - 3 gal.	18 gal.	Dormant.	
Pecan bud moth (Gretchena bolliana)	DDT	--	--	WP	1	10	4 - 5 times 2 - 3 weeks apart when insect appears.	
	Malathion	8	0	WP	0.75	7.5		
	Parathion	--	--	WP	0.3	3		
				D	--	0.5		

*Apply by airplane.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PECAN								
Pecan leaf casebearer (Acrobasis juglandis)	Azinphosmethyl	--	--	WP	0.5	5	When buds begin to open or when infestation appears from late June to August.	Do not use azinphosmethyl, EPN, or parathion in small home plantings; should be applied only by a trained operator.
	EPN	0.5	21	WP	0.37	3.75		
	Malathion	8	0	WP	0.75	7.5		Do not apply insecticides without tolerances after shucks begin to open.
				EC	--	2.5*		
				D	--	2*		
	Parathion	--	--	WP	0.3	3		Do not graze livestock in treated groves.
Pecan nut casebearer (Acrobasis caryae)	Azinphosmethyl	--	--	WP	0.5	5	When first-brood larvae begin to enter nuts (in Florida about time tips of nuts turn brown; in other areas about the time catkin shed is complete on such varieties as Schley, Stuart, or Mahan); repeat after 7 days if needed.	
				EC	--	1*		
	Carbaryl	--	--	WP	1	10		
	DDT	--	--	WP	1.5	15		
	Endosulfan	--	--	WP	0.75	7.5		
	EPN	0.5	21	WP	0.37	3.75		
	Malathion	8	0	WP	0.75	7.5		
				D	--	4		
				EC	--	4*		
	Parathion	--	--	WP	0.3	3		
				D	--	1		
				EC	0.37	3.75		

*Apply by airplane.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PECAN								
Pecan phylloxera (Phylloxera devastatrix)	Benzene hexachloride	--	--	WP	0.25 (gamma)	1.5	Delayed dormant or until buds show 1 - 2 in. of growth.	Do not use azinphosmethyl, EPN, or parathion in small home plantings; should be applied only by a trained operator.
	Lindane	--	--	WP	0.3	2		
	Malathion	8	0	WP	0.75	4.5		
	Dinitrobutyl-phenol	--	--	EC	2	12	Any time from late February until buds begin to swell.	Do not apply insecticides without tolerances after shucks begin to open.
	Dinitrocyclo-hexylphenol + Mineral oil	--	--	WP + EC or emulsion	0.8 + 2 gallons	5 + 12 gallons		Do not graze livestock in treated groves.
Pecan weevil (Curculio caryae)	DDT	--	--	WP	3	30	When at least 6 weevils can be jarred from any tree, and 10-14 days later; and, if EPN is used, 10-14 days later.	
	EPN	0.5	21	WP	0.37	3.75		
	Toxaphene	7	0	EC or WP	2.5	25		
Southern green stink bug (Nezara viridula)	Azinphosmethyl	--	--	WP	0.5	5	2 - 3 times, 2 weeks apart beginning August 10-15.	
	EPN	0.5	21	WP	0.37	3.75		
	Parathion	--	--	WP	0.3	3		
Spittlebugs (Clastoptera spp.)	Azinphosmethyl	--	--	EC	0.4	4	When first leaves are half grown and later, as new generations appear.	
	Benzene hexa-chloride	--	--	WP	0.2 (gamma)	2		
	Endosulfan	--	--	WP	0.6	6		

Continued

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TREE-NUT INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY UNLESS OTHERWISE INDICATED		WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
					PER 100 GAL.	PER ACRE		
PECAN								
Spittlebugs (Clastoptera spp.) (con.)	Parathion	--	--	WP	0.3	3	When first leaves are half grown and later, as new generations appear.	Do not use azinphosmethyl, EPN, or parathion in small home plantings; should be applied only by a trained operator. Do not apply insecticides without tolerances after shucks begin to open. Do not graze livestock in treated groves.
	Toxaphene	7	0	WP	1	10		
Twig girdler (Oncideres cingulata)	Azinphosmethyl	--	--	WP	0.5	5	3 times, 2 weeks apart when first injury is noted.	
	DDT	--	--	WP	2	20		
	EPN	0.5	21	WP	0.37	3.75		
	Parathion	--	--	WP	0.45	4.5		
Walnut caterpillar (Datana integerrima)	Azinphosmethyl	--	--	WP	0.5	5	When caterpillars are first noticed and still small.	
	DDT	--	--	WP	1	10		
	EPN	0.5	21	WP	0.37	3.75		
	Parathion	--	--	WP	0.3	3		

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
ASPARAGUS							
Asparagus beetle (Crioceris asparagi)	Carbaryl	10	1	D or WP	2	On foliage as needed.	Do not repeat carbaryl application within 3 days.
	DDT	7	--	D, EC, or WP	1.5		
	Malathion	8	1	D or EC	1.25		Do not apply DDT during cutting season.
	Rotenone	Exempt	1	D, extract, or powder	0.3		
Cutworms	Toxaphene	--	--	3% B; 2.5 lb. 40% WP or 1.25 pt. 63% EC + 1-2 qt. light mineral oil in 25 lb. bran	40 lb. bait	Broadcast on soil (not on plants) late in afternoon.	Do not apply toxaphene after edible portions form.
Thrips	Malathion	8	1	D or EC	1.2	On foliage as needed.	
Wireworms	DDT (only on irrigated lands in West)	7	--	EC or WP	10	Broadcast on soil before planting and thoroughly work into upper 6-9 in.	Do not repeat soil application of DDT or dieldrin for at least 3 years.
	Dieldrin (in East)	0.1	--	EC or WP	3		
	Ethylene dibromide (in West)	10 (inorganic bromide)	--	83% soln. (12 lb. per gal.	36	Inject 8 in. into fallow soil every 12 in.	Do not apply ethylene dibromide within 3 weeks before planting.
BEANS							
Aphids	Demeton	0.3	21	EC	0.3-0.5	On foliage as needed.	Do not use demeton, mevinphos, or parathion in home garden; should be applied only by a trained operator.
	Diazinon	0.75 beans 10 hay 25 forage	7 beans 4 hay 1 forage	D EC or WP	1.4 0.5		
	Malathion	8	1	D, EC, or WP	1.2		
	Mevinphos	0.25	1	D, EC, or WP	0.5		
	Naled	--	4	D or EC	1-2		
	Parathion	1	15	D, EC, or WP	0.5		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BEANS							
Bean leaf beetle (Cerotoma trifurcata)	Carbaryl	10	1	D or WP	0.5 - 1	On foliage as needed.	Do not use mevinphos in home garden; should be applied only by a trained operator.
	DDT	7	7	D, EC, or WP	1	Apply DDT sparingly; heavy dosages may injure beans.	
	Rotenone (home garden only)	Exempt	1	D, EC, or powder	0.3		
Bean thrips (Caliothrips fasciatus)	DDT	7	7	D or EC	1		Do not feed plants treated with DDT or toxaphene to dairy animals or animals being finished for slaughter.
	Mevinphos	0.25	1	EC	0.3		
Corn earworm (Heliothis zea)	Carbaryl	10	1	D or WP	1 - 2		
	DDT	7	7	D, EC, or WP	2		
	Methoxychlor (home garden only)	14	7*	D or WP	1.5		
	Naled	--	4	EC	1.5		
Cowpea curculio (Chalcodermus aeneus)	Dieldrin	0	--	G	3	Broadcast on soil surface shortly before plants begin to bloom but only when plants are dry.	Do not apply dieldrin after pods begin to form.
	Toxaphene	7	--	D, EC, or WP	3	On foliage at time of blooming; repeat in 3 and 6 days.	Do not apply toxaphene spray after pods begin to form on beans to be used as green snaps; do not apply toxaphene dust to such beans within 7 days before harvest.
Cucumber beetles (Diabrotica spp.)	Carbaryl	10	1	D or WP	2	On foliage as needed.	
	DDT	7	7	D, EC, or WP	1	Apply DDT sparingly; heavy dosages may injure beans.	
	Diazinon	0.75 beans 10 hay 25 forage	7 beans 4 hay 1 forage	WP	4 - 6 oz.		
	Malathion	8	1	D, EC, or WP	1.2		

*3 days if plants are not to be used for food.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BEANS							Do not use dichloropropane-dichloropropene mixture, parathion, or Telone in home garden; should be applied only by a trained operator. Do not feed plants treated with DDT or toxaphene to dairy animals or animals being finished for slaughter. After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not apply dichloropropane-dichloropropene mixture or Telone within 3 weeks before planting; do not apply to extremely heavy soil or soil which is very wet or very dry. Do not apply toxaphene spray after pods begin to form to beans to be used as green snaps; do not apply toxaphene dust to such beans within 7 days before harvest.
Cutworms (in soil)	DDT	7	7	D, EC, or WP	2	Broadcast on soil surface, preferably before planting.	
	Toxaphene	7	--	D, EC, or WP	2		
				3% B	1.2	Broadcast on soil (not plants) late in afternoon.	
Flea beetles	DDT	7	7	D, EC, or WP	1	On foliage as needed.	
	Methoxychlor (home garden only)	14	7*	D or WP	1.5		
Garden symphylan (Scutigerella immaculata)	Parathion	1	15	G or WP	5	Broadcast on soil surface before planting and thoroughly work into upper 6 in.	
	Dichloropropane-dichloropropene mixture	--	--	Fumigant	300 (30 gal.)	Inject 8 in. deep into fallow soil every 12 in.	
	Telone	--	--	Fumigant	300 (30 gal.)		
Japanese beetle (home garden) (Popillia japonica)	Carbaryl	10	1	D or WP	2	On foliage as needed.	
	Malathion	8	1	D, EC, or WP	1.2		
Lesser cornstalk borer (Elasmopalpus lignosellus)	Aldrin	0	--	EC or G	12 oz.	Apply in band 5 in. wide over seedling plants when in 2-leaf stage.	
	Diazinon	0.75 beans 10 hay 25 forage	7 beans 4 hay 1 forage	G	0.5		
	Dieldrin	0	--	EC or G	12 oz.		
Lima bean pod borer (Etiella zinckenella)	Carbaryl	10	1	D or WP	2	On foliage when pods begin to form, and at 10-day intervals.	

*3 days if plants are not to be used for feed.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BEANS							
Lygus bugs	Carbaryl	10	1	D or WP	2	On foliage when pods begin to form.	Do not use carbophenothion, disulfoton, or parathion in home garden; should be applied only by a trained operator.
	DDT	7	7	D, EC, or WP	2		
	Toxaphene + Malathion	7 + 8	--	D, EC, or WP	3 + 1		
Mexican bean beetle (Epilachna varivestis)	Carbaryl	10	1	D or WP	0.5 - 1	On foliage as needed.	Do not feed plants treated with DDT or toxaphene to dairy animals or animals being finished for slaughter. Do not apply toxaphene spray after pods begin to form to beans to be used as green snaps; do not apply toxaphene dust to such beans within 7 days before harvest. Do not apply carbophenothion more than twice per season.
	Carbophenothion	0.8 beans 5 vines	21*	EC or WP	0.5		
	Diazinon	0.75 beans 10 hay 25 forage	7 beans 4 hay 1 forage	WP	0.5		
	Malathion	8	1	D, EC, or WP	1.2		
	Methoxychlor	14	7**	D or WP	1.5		
	Naled	--	4	EC	1.5		
	Parathion	1	15	D, EC, or WP	0.5		
	Rotenone (home garden only)	Exempt	1	D, EC, extract, or powder	0.3		
	Disulfoton	0.75 beans 5 vines	--	G	1	Apply in furrow below seed at planting time. Avoid contact of insecticide with seed. Make only 1 application.	
Potato leafhopper (Empoasca fabae)	Carbaryl	10	1	D or WP	2	On foliage as needed. Apply DDT sparingly; heavy dosages may injure beans.	
	DDT	7	7	D, EC, or WP	1		
	Malathion	8	1	D, EC, or WP	1.2		
	Methoxychlor	14	7**	D or WP	1.5		
	Parathion	1	15	D, EC, or WP	0.5		

Continued

*7 days if plants are not to be used for feed.

**3 days if plants are not to be used for feed.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BEANS							
Potato leafhopper (Empoasca fabae) (con.)	Disulfoton	0.75 beans 5 vines	--	G	1	Apply in furrow below seed at planting time. Avoid contact of insecticide with seed. Make only 1 application.	Do not use carbophenothion, demeton, or disulfoton in home garden; should be applied only by a trained operator.
Root maggots	Aldrin Dieldrin Lindane	0 0 10	-- -- --	Slurry: 2/3 oz. 75% WP + 3 oz. thiram or captan 75% WP in water to make 1 pt.	1 pt. slurry/100 lb. bean seed	Mix slurry with seed and dry at least 1 hour within 30 days of planting. Do not re-treat commercially treated seed.	Do not apply toxaphene spray after pods begin to form to beans to be used as green snaps; do not apply toxaphene dust to such beans within 7 days before harvest.
Salt-marsh caterpillar (Estigmene acrea)	Toxaphene	7	--	D, EC, or WP	4	On foliage when small caterpillars appear.	
Spider mites (Tetranychus spp.)	Carbophenothion Demeton Dicofol	0.8 beans 5 vines 0.3 5	7* 21 7	D EC or WP EC EC or WP	1.2 0.75 0.3 - 0.5 10 oz.	On foliage as needed.	Do not feed plants treated with DDT or toxaphene to dairy animals or animals being finished for slaughter. Do not apply carbophenothion more than twice per season.
Stink bugs	Carbaryl DDT Naled	10 7 --	1 7 4	D or WP D, EC, or WP EC	2 1 1.5	Apply DDT sparingly; heavy dosages may injure beans.	Do not feed plants treated with dicofol to meat or dairy animals.
Western bean cutworm (Loxagrotis albicosta)	DDT	7	7	D	1 - 1.5	On foliage as soon as cutworms are found. Use sparingly; heavy dosages may injure beans.	
Wireworms In East	Aldrin** Chlordane** Dieldrin**	0 0.3 0	-- -- --	EC, G, or WP EC, G, or WP EC, G, or WP	2 - 3 4 - 8 2 - 3	Broadcast on soil before planting and thoroughly work into upper 4 - 6 in.	Do not repeat soil applications of aldrin, chlordane, or dieldrin for at least 3 years.

Continued

*If indicated dosage is applied, do not feed treated plants to livestock; however, if only 0.5 pounds carbophenothion is used per acre, vines may be harvested for feeding 21 days after treatment.

**May not give adequate control in the Southeast.

CROP AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BEANS							
Wireworms In East (con.)	Diazinon	0.75 beans 10 hay 25 forage	--	EC, G, or WP	1.5 - 2	Broadcast on soil before planting and thoroughly work into upper 4 - 6 in.	Do not use parathion in home garden; should be applied only by a trained operator.
	Parathion	1	--	EC, G, or WP	3		
In West	DDT	7	--	EC, G, or WP	10	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. Apply DDT at least 6 weeks before planting. Soil temperature must be at least 50° F. when diazinon or parathion is applied.	After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not repeat applications of DDT for at least 3 years.
	Diazinon	0.75 beans 10 hay 25 forage	--	G	3 - 4		
	Parathion	1	--	G	4		
BEET, TABLE							
Aphids	Diazinon	0.75	14	D, EC, or WP	6 - 8 oz.	On foliage when aphids appear; repeat weekly as needed.	Do not use mevinphos or parathion in home garden; should be applied only by a trained operator.
	Malathion	8	7	D, EC, or WP	1.2		
	Mevinphos	1	3	D, EC, or WP	0.3 - 0.5		
	Parathion	1	21*	D, EC, or WP	0.3 - 0.5		
Beet webworm (Loxostege sticticalis)	DDT	7	--	D, EC, or WP	1.5	On foliage as needed.	Do not use DDT-treated tops for food or feed.
	Pyrethrum (home garden only)	Exempt	1	0.2% D EC	1 oz. 0.5 oz.		
Blister beetles	Carbaryl	12 tops 5 roots	14**	D or WP	1.5	On beetles as needed.	
	DDT	7	--	D, EC, or WP	1.5		

Continued

*15 days if tops are not to be used for food or feed.
**3 days if tops are not to be used for food or feed.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BEET, TABLE							
Blister beetles (con.)	Methoxychlor	14	14 tops 7 roots	D or WP	1.5	On beetles as needed.	Do not use parathion in home garden; should be applied only by a trained operator.
	Parathion	1	21*	D, EC, or WP	0.5		
Cutworms	DDT	7	--	D, EC, or WP	2	To soil as needed.	
Flea beetles	DDT	7	--	D, EC, or WP	1.5	On foliage as needed.	Do not use DDT- or trichlorfon-treated tops for food or feed.
	Methoxychlor	14	14 tops 7 roots	D or WP	1.5		
Leaf miners	Trichlorfon	--	28	Soluble powder	0.5		
Wireworms							
In West	DDT	7	--	EC or WP	10	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in.	After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not repeat soil application of chlordane or DDT for at least 3 years.
	Parathion	1	--	G	4		
In Northeast	Chlordane	0.3	--	EC or WP	6 - 8	Apply DDT in fall or at least 6 weeks before planting. Soil temperature must be at least 50° F. when parathion is applied.	
In Southeast	Chlordane**	0.3	--	EC, G, or WP	4 - 6	Broadcast on soil before planting and thoroughly work into upper 4 - 6 in. with double-disk harrow.	
	DDT***	7	--	EC, G, or WP	20		
	Parathion	1	--	EC, G, or WP	3		
BROCCOLI							
Aphids	Azinphosmethyl	2	15	D or EC	0.75	On foliage when aphids appear; repeat weekly as needed. For transplants add demeton to transplant water. See FB 2148, p.14.	Do not use azinphosmethyl or demeton in home garden; should be applied only by a trained operator.
	Demeton	0.75	21	EC	0.3 - 0.5		
	Diazinon	0.75	7	D EC or WP	0.5 - 1 0.5		

Continued

*15 days if tops are not to be used for food or feed.

**Not effective against southern potato wireworm.

***For southern potato wireworm only.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BROCCOLI							
Aphids (con.)	Malathion	8	3	D, EC, or WP	1.2	On foliage when aphids appear; repeat weekly as needed. For transplants add demeton to transplant water. See FB 2148, p. 14.	Do not use azinphosmethyl, demeton, disulfoton, mevinphos, methyl parathion, or parathion in home garden; should be applied only by a trained operator.
	Mevinphos	1	3	D, EC, or WP	0.3 - 0.5		
	Naled	--	4	D or EC	1 - 2		
	Parathion	1	7	D, EC, or WP	0.5		
	Disulfoton	0.75	14	G	1	Apply in furrow at planting time or as sidedressing after plant emergence. For best results apply separately from fertilizer.	Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 14 days after treatment.
Caterpillars	Bacillus thuringiensis	Exempt	--	3% aqueous suspension concentrate*	2 - 3 qt. concentrate	On foliage every 7 days. On summer or fall plantings in South begin when true leaves appear; on other plantings when insects appear.	Do not apply disulfoton more than once per season.
				25 billion spores per gram WP	4 lb. WP		
	Endosulfan**	2	7	D or EC	0.8 - 1.0		
	Endosulfan + Methyl parathion	2 + 1	21	EC	1 + 0.75	Insecticides may not control cabbage looper under all conditions. Apply to both sides of leaves when larvae are small.	
	Endosulfan + Parathion	2 + 1	7	D or EC	12 oz. + 8 oz.		
	Azinphosmethyl	2	15	D or EC	0.75		
	Malathion (home garden only)	8	3	D, EC, or WP	1.2		
	Mevinphos	1	3	D or EC	0.5		
	Naled	--	4	D or EC	1 - 2		
	Parathion	1	7	D, EC, or WP	0.5		
	Toxaphene	7	--	D or WP	3 - 4		Do not apply toxaphene after appearance of plant parts that are to be eaten or marketed.
				EC	2 - 3***		
	Toxaphene + Parathion	7 + 1	--	D or WP	3 - 4 + 0.5		
				EC	2 - 3*** + 0.5		

*This is equivalent to 30 billion viable spores per gram of liquid concentrate.

**May not give adequate control of the imported cabbageworm and fall armyworm in the Southeast.

***More than 2.5 lb. per acre may cause plant injury if applied in low-gallonage emulsion sprays. Use at least 50 gallons of water per acre when parathion is added to toxaphene emulsion.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BROCCOLI							
Cutworms (soil)	DDT	7	--	D, EC, or WP	2	Broadcast on soil as needed.	Do not apply DDT or toxaphene after appearance of plant parts that are to be eaten or marketed.
	Toxaphene	7	--	D, EC, or WP	2		
				3% B	0.9	Spread on soil (not plants) late in afternoon.	
Flea beetles	DDT	7	--	D, EC, or WP	1.2	On foliage as needed.	
	Endosulfan	2	7	D, EC, or WP	0.75		
	Methoxychlor	14	14	D or WP	1.2		
	Rotenone	Exempt	1	D	0.3		
Harlequin bug (Murgantia histrionica) and stink bug	DDT	7	--	D, EC, or WP	1.2		
	Endosulfan	2	7	D, EC, or WP	0.75		
	Naled	--	4	EC	1.2		
Mole crickets	Chlordane	0.3	--	D, EC, G, or WP	1.5 - 2	Broadcast on soil as needed.	Do not apply chlordane to plants past seedling stage of growth.
				Drench: 4 oz. 40% WP/100 gal.	100 gal. drench per 1,000 sq. ft.	To surface of seed bed before planting.	
Root maggots	Chlordane*	0.3	--	D, EC, or WP	1.5	To soil at base of plants when leaves appear; repeat shortly after transplanting or thinning.	
	Diazinon	0.75	--	EC, G, or WP	2 - 3	Broadcast on soil before planting and thoroughly work into upper 3 - 4 in.	
	Chlordane*	0.3	--	Drench: 1 lb. 40 or 50% WP per 100 gal.	1 cup drench/plant	On soil where each transplant is set.	
	Diazinon	0.75	7				

*Not effective in some areas.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BROCCOLI							
Vegetable weevils (Listroderes spp.)	DDT	7	--	D, EC, or WP	1.2	On foliage as needed.	Do not use parathion in home garden; should be applied only by a trained operator. After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not apply DDT after appearance of plant parts that are to be eaten or marketed. Do not repeat soil application of DDT for at least 3 years.
	Parathion	1	7	D, EC, or WP	0.5		
	Rotenone (home garden only)	Exempt	1	D, EC, or powder	0.3		
Wireworms In West	DDT	7	--	EC, G, or WP	10	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. Apply DDT at least 6 weeks before planting. Soil temperature must be at least 50° F. when diazinon or parathion is applied.	
	Diazinon	0.75	--	G	3 - 4		
	Parathion	1	--	G	4		
BRUSSELS SPROUTS							
Aphids	Demeton	0.75	21	EC	0.3 - 0.5	On foliage when aphids appear; repeat weekly as needed. For transplants add demeton to transplant water. See FB 2148, p. 14.	Do not use demeton, disulfoton, mevinphos, or parathion in home garden; should be applied only by a trained operator. Do not apply disulfoton more than twice per season.
	Malathion	8	7	D, EC, or WP	1.2		
	Mevinphos	1	3	D, EC, or WP	0.5		
	Naled	--	4	D or EC	1 - 2		
	Parathion	1	15	D, EC, or WP	0.5		
	Disulfoton	0.75	30	G	1	Apply in furrow at planting time or as sidedressing after plant emergence. For best results apply separately from fertilizer.	

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BRUSSELS SPROUTS							
Caterpillars	Malathion (home garden only)	8	7	D, EC, or WP	1.2	On foliage every 7 days. On summer or autumn plantings in South begin when true leaves appear; on other plantings when insects appear. Insecticides may not control cabbage looper under all conditions. Apply to both sides of leaves when larvae are small.	Do not use mevinphos or parathion in home garden; should be applied only by a trained operator. Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 22 days after treatment. Do not apply DDT or toxaphene after appearance of plant parts to be eaten or marketed.
	Mevinphos	1	3	D, EC, or WP	0.5		
	Naled	--	4	D or EC	1-2		
	Parathion	1	15	D, EC, or WP	0.5		
	Toxaphene	7	--	D or WP EC	3-4 2-3*		
	Toxaphene + parathion	7 + 1	--	D or WP EC	3-4 + 0.5 2-3* + 0.5		
Cutworms (soil)	DDT	7	--	D, EC, or WP	2	On soil as needed.	
	Toxaphene	7	--	D, EC, or WP	2		
				3% B	0.9	Spread on soil (not plants) in late afternoon.	
Flea beetles	DDT	7	--	D, EC, or WP	1.2	On foliage as needed.	
	Methoxychlor	14	14	D or WP	1.2		
Harlequin bug (Murgantia histrionica) and stink bug	DDT	7	--	D, EC, or WP	1.2		
	Naled	--	4	EC	1.5		
Root maggots	Chlordane**	0.3	--	D, EC, or WP	1.5	To soil at base of plants when leaves first appear; repeat shortly after transplanting or thinning.	Do not apply chlordane to plants past seedling stage.
				Drench: 1 lb. 40% WP/100 gal.	1 cup drench/plant	On soil where each transplant is set.	

*More than 2.5 lb. per acre may cause plant injury if applied in low-gallonage emulsion sprays. Use at least 50 gallons of water per acre when parathion is added to toxaphene emulsion.

**Not effective in some areas.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
BRUSSELS SPROUTS							
Wireworms In West	DDT	7	--	EC or WP	10	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. with double-disk harrow. Apply DDT in the fall or at least 6 weeks before planting. Soil temperature must be at least 50° F. when parathion is applied.	Do not use parathion in home garden; should be applied only by a trained operator. After applying parathion to soil, keep all persons and animals off treated areas for 48 hours. Do not repeat soil application of DDT for at least 3 years.
	Parathion	1	--	G	4		
CABBAGE							
Aphids	Azinphosmethyl	2	21	D, EC, or WP	12 oz.	On foliage when aphids appear; repeat weekly as needed. For transplants add demeton to transplant water. See FB 2148, p. 14.	Do not use azinphosmethyl, demeton, disulfoton, mevinphos, or parathion in home garden; should be applied only by a trained operator. Do not apply disulfoton more than once per season. Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 17 days after treatment.
	Demeton	0.75	21	EC	0.3 - 0.5		
	Diazinon	0.75	7	D	0.5 - 1		
				EC or WP	0.5		
	Malathion	8	7	D, EC, or WP	1 - 1.2		
	Mevinphos	1	1	D, EC, or WP	0.3 - 0.5		
	Naled	--	4	D or EC	1 - 2		
	Parathion	1	10	D, EC, or WP	0.4 - 0.5		
	Disulfoton	0.75	42	G	1	In furrow at planting or as sidedressing after plants emerge. For best results apply separately from fertilizer.	

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CABBAGE							
Caterpillars	Azinphosmethyl	2	21	D or EC	0.75	On foliage every 7 days. On summer or autumn plantings in South begin when true leaves appear; on other plantings when insects appear.	Do not use azinphosmethyl, methyl parathion, mevinphos, or parathion in home garden; should be applied only by a trained operator.
	Bacillus thuringiensis	Exempt	--	3% aqueous suspension concentrate*	2 - 3 qt. concentrate		
				25 billion spores per gram WP	4 lb. WP		
	Endosulfan**	2	7	D or EC	1	These insecticides may not control cabbage looper under all conditions. Apply on both sides of leaves when larvae are small.	
	Endosulfan + methyl parathion	2 + 1	21	EC	1 + 0.75		
	Endosulfan + parathion	2 + 1	10	D or EC	0.75 + 0.5		Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 17 days after treatment.
	Malathion (home garden only)	8	7	D, EC, or WP	1.2		
	Mevinphos	1	1	D, EC, or WP	0.5		
	Naled	--	4	D or EC	1 - 2		
	Parathion	1	10	D, EC, or WP	0.5		
	Toxaphene + DDT (Southwest only)	7	--	D, EC, or WP	3*** + 1		Do not apply DDT or toxaphene after heads begin to form.
	Toxaphene + parathion	7 + 1	--	D or WP	3 - 4 + 0.5		
				EC	2 - 3*** + 0.5		
	Toxaphene	7	--	D or WP	3 - 4		
				EC	2 - 3***		
Cutworms (soil)	DDT	7	--	D, EC, or WP	2	Broadcast on soil surface.	
	Toxaphene	7	--	D, EC, or WP	2		
				3% B	0.9	Spread on soil (not plants) in late afternoon.	

*This is equivalent to 30 billion viable spores per gram of liquid concentrate.

**May not give adequate control of the imported cabbageworm and fall armyworm in the Southeast.

*** More than 2.5 lb. per acre may cause plant injury if applied in low-gallonage emulsion sprays. Use at least 50 gallons of water per acre when parathion is added to toxaphene emulsion.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CABBAGE							
Flea beetles	DDT	7	--	D, EC, or WP	1.2	On foliage as needed.	Do not use parathion in home garden; should be applied only by a trained operator. Do not apply DDT after heads begin to form.
	Endosulfan	2	7	D or EC	0.75		
	Methoxychlor	14	3	D or WP	1.2		
	Naled	--	4	EC	1.5		
Harlequin bug (Murgantia histrionica) and stink bug	DDT	7	--	D, EC, or WP	1.2		
	Endosulfan	2	7	D, EC, or WP	0.75		
	Naled	--	4	EC	1.5		
Mole crickets	Chlordane	0.3	--	D, EC, G, or WP	1.5 - 2	Broadcast on soil surface.	Do not apply chlordane to plants past seedling stage.
				Drench: 4 oz. 40% WP/100 gal.	100 gal. drench/ 1,000 sq. ft.	Broadcast on surface of seed bed before planting.	
Root maggots	Chlordane*	0.3	--	D, EC, or WP	1.5	To soil at base of plants when leaves appear; repeat shortly after transplanting or thinning.	
	Diazinon	0.75	--	EC, G, or WP	2 - 3	Broadcast on soil before planting and thoroughly work into upper 3 - 4 in.	
	Chlordane*	0.3	--	Drench: 1 lb. 40 or 50% WP/100 gal.	1 cup drench/plant.	To soil where each transplant is set.	Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after foliage application, do not harvest for 17 days after treatment.
	Diazinon	0.75	--				
Vegetable weevil (Listroderes spp.)	DDT	7	--	D, EC, or WP	1.2	On foliage as needed.	
	Parathion	1	10	D, EC, or WP	0.5		
	Rotenone (home garden only)	Exempt	1	D, EC, or powder	0.3		

*Not effective in some areas.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CABBAGE							
Wireworms In West	DDT	7	--	EC, G, or WP	10	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. Apply DDT in fall or at least 6 weeks before planting. Soil temperature must be at least 50° F. when diazinon or parathion is applied.	Do not use parathion in home garden; should be applied only by a trained operator. After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not repeat soil application of DDT for at least 3 years.
	Diazinon	0.75	--	G	3 - 4		
	Parathion	1	--	G	4		
CANTALOUP							
Aphids	Diazinon	0.75	3	D EC or WP	0.8 - 1 0.75	On foliage as needed.	Do not use mevinphos or parathion in home garden; should be applied only by a trained operator.
	Endosulfan	2	1	D EC or WP	1 0.5		
	Malathion	8	1	D or EC	1.7		
	Mevinphos	0.5	1	D or EC	0.5		
	Naled (home garden only)	--	7	D or EC	1 - 2		
	Parathion	1	7	D or EC	0.3 - 0.5		Do not apply parathion before vining.
Beet leafhopper (Circulifer tenellus)	Parathion	1	7	D or EC	0.5		
Cucumber beetles (Diabrotica spp.)	Malathion	8	1	D or EC	1.7		
	Methoxychlor	14	1	D or WP	1.7		
	Parathion	1	7	D or EC	0.3 - 0.5		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CANTALOUP							
Leafhoppers (southern garden and western potato) (Empoasca spp.)	Malathion	8	1	D or EC	1.7	On foliage as needed.	Do not use carbophenothion or parathion in home garden; should be applied only by a trained operator. Do not apply parathion before vining.
	Parathion	1	7	D or EC	0.3 - 0.5		
Leaf miners	Naled (home garden only)	--	7	D or EC	1.5		
	Parathion	1	7	D or EC	0.3 - 0.5		
Pickleworm (Diaphania nitidalis)	Carbaryl	10	1	D or WP	1	On foliage when worms appear in blossoms; repeat weekly as needed.	Do not use lindane in fields to be planted within 2 years to peanuts or root crops as it may adversely affect their flavor.
	Lindane*	10	1	D or WP	0.2 - 0.4		
Spider mites (Tetranychus spp.)	Carbophenothion	0.8	5	D, EC or WP	1	On foliage as needed.	
	Dicofol	5	2	EC D	0.5 1		
	Parathion	1	7	D or EC	0.3 - 0.5		
	Tetradifon	1	1	D EC or WP	1 0.5		
Thrips	Parathion	1	7	D or EC	0.25 - 0.5		
Wireworms	Chlordane (in East)	0.3	--	EC or WP	4 - 8	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. with double-disk harrow. Apply DDT in fall or at least 6 weeks before planting. Soil temperature must be at least 50° F. when diazinon or parathion is applied.	Do not repeat application of chlordane, DDT, or dieldrin for at least 3 years. After applying parathion to soil, keep all persons and animals off treated area for 48 hours.
	DDT (in West)	7	--	EC or WP	10		
	Diazinon	0.75	--	G	3 - 4		
	Dieldrin (in East)	0	--	EC or WP	3		
	Parathion	1	--	G	4		
	Ethylene dibromide (in West)	75 (inorganic bromide)	--	83% soln. (12 lb./gal.)	36	Inject 8 in. deep into fallow soil every 12 in.	Do not apply ethylene dibromide within 3 weeks before planting.

*When used with zineb or maneb every 5 days, reduce dosages of lindane by one-half.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CARROT							
Carrot rust fly (Psila rosae)	Diazinon	0.75	--	G	2	To seed furrow at planting time.	Do not use parathion in home garden; should be applied only by a trained operator. Do not apply diazinon after planting. Do not use DDT-treated tops for food or feed.
Leafhoppers	Carbaryl	10	1	D or WP	1 - 2	On foliage as needed.	
	DDT	7	--	D, EC, or WP	1.2		
	Malathion	8	7	D, EC, or WP	1.5		
	Methoxychlor	14	14 tops 7 roots	D or WP	1.2		
Vegetable weevils (Listroderes spp.)	DDT	7	--	D, EC, or WP	1.2		
	Parathion	1	15	D, EC, or WP	0.5		
	Rotenone (home garden only)	Exempt	1	D, EC, or powder	0.3		
Wireworms In West	DDT	7	--	EC or WP	10	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. Apply DDT in fall or at least 6 weeks before planting. Soil temperature must be at least 50° F. when diazinon or parathion is applied.	Do not repeat application of DDT to soil for at least 3 years. After applying parathion to soil, keep all persons and animals off treated area for 48 hours.
	Diazinon	0.75	--	G	3 - 4		
	Parathion	1	--	G	4		
In Southeast	DDT*	7	--	EC, G, or WP	20	Broadcast on soil before planting and thoroughly work into upper 4 - 6 in. with double-disk harrow. Apply DDT in fall or at least 6 weeks before planting.	
	Diazinon	0.75	--	EC or WP	2		
	Parathion	1	--	EC or WP	3		

*For southern potato wireworm only.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CAULIFLOWER							
Aphids	Azinphosmethyl	2	15	D or EC	0.75	On foliage when aphids appear; repeat weekly as needed. For transplants add demeton to transplant water. See FB 2148, p. 14.	Do not use azinphosmethyl, demeton, disulfoton, mevinphos, or parathion in home garden; should be applied only by a trained operator.
	Demeton	0.75	21	EC	0.3 - 0.5		
	Diazinon	0.75	5	D EC or WP	0.5 - 1.0 0.5		
	Malathion	8	7	D, EC, or WP	1.2		
	Mevinphos	1	3	D, EC, or WP	0.3 - 0.5		
	Naled	--	4	D or EC	1 - 2		
	Parathion	1	7	D, EC, or WP	0.5		Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 14 days after treatment.
	Disulfoton	0.75	40	G	1	Apply in furrow at planting time or as sidedressing after plant emergence. For best results apply separately from fertilizer.	
Caterpillars	Azinphosmethyl	2	15	D or EC	0.75	On foliage every 7 days. On summer or autumn plantings in South begin when true leaves appear; on other plantings when insects appear.	Do not apply disulfoton more than twice per season.
	Bacillus thuringiensis	Exempt	--	3% aqueous suspension concentrate* 25 billion spores per gram WP	2 - 3 qt. concentrate 4 lb. WP		
	Endosulfan**	--	--	D or EC	0.75	Insecticides may not control cabbage looper under all conditions. Apply to both sides of leaves when larvae are small.	Do not apply endosulfan after appearance of plant parts to be eaten or marketed.
	Endosulfan + methyl parathion	1 methyl parathion only	--	EC	1 + 0.75		
	Endosulfan + parathion	1 parathion only	--	D or EC	0.75 + 0.5		
	Malathion (home garden only	8	7	D, EC, or WP	1.2		
Continued	Mevinphos	1	3	D, EC, or WP	0.5		

*This is equivalent to 30 billion viable spores per gram of liquid concentrate.

**May not give adequate control of the imported cabbageworm and fall armyworm in the Southeast.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CAULIFLOWER							
Caterpillars (con.)	Naled	--	4	D or EC	1-2	On foliage every 7 days. On summer or autumn plantings in South begin when true leaves appear; on other plantings when insects appear. Insecticides may not control cabbage looper under all conditions. Apply to both sides of leaves when larvae are small.	Do not use parathion in home garden; should be applied only by a trained operator. Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 14 days after treatment. Do not apply DDT or toxaphene after the curd begins to form. Do not apply endosulfan after appearance of plant parts to be eaten or marketed.
	Parathion	1	7	D, EC, or WP	0.5		
	Toxaphene	7	--	D or WP EC	3-4 2-3*		
	Toxaphene + DDT (Southwest only)	7	--	D, EC, or WP	3* + 1		
	Toxaphene + parathion	7 + 1	--	D or WP EC	3-4 + 0.5 2-3* + 0.5		
Cutworms (soil)	DDT	7	--	D, EC, or WP	2	Broadcast on soil as needed.	
	Toxaphene	7	--	D, EC, or WP	2		
				3% B (home garden only)	0.9	Spread on soil (not plants) late in afternoon.	
Flea beetles	DDT	7	--	D, EC, or WP	1.2	On foliage as needed.	
	Endosulfan	--	--	D, EC, or WP	0.75		
	Methoxychlor	14	7	D or WP	1.2		
	Rotenone	Exempt	1	D	0.3		
Harlequin bug (Murgantia histrionica) and stink bug	DDT	7	--	D, EC, or WP	1.2		
	Endosulfan	--	--	D or EC	0.75		
	Naled	--	4	EC	1.5		
Mole crickets	Chlordane	0.3	--	D, EC, or WP	1.5-2.0	Broadcast on soil as needed.	Do not apply chlordane if plants are past seedling stage.
				Drench: 4 oz. 40% WP/100 gal.	100 gal. drench per 1,000 sq. ft.	To surface of seed bed before planting.	

*More than 2.5 lb. per acre may cause plant injury if applied in low-gallonage emulsion sprays. Use at least 50 gallons of water per acre when parathion is added to toxaphene emulsion.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CAULIFLOWER							
Root maggots	Chlordane*	0.3	--	D, EC, or WP	1.5	To soil at base of plants when leaves appear; repeat shortly after transplanting or thinning.	Do not use parathion in home garden; should be applied only by a trained operator.
	Diazinon	0.75	--	EC, G, or WP	2 - 3	Broadcast on soil before planting and thoroughly work into upper 3 - 4 in.	Do not apply chlordane if plants are past seedling stage.
	Chlordane*	0.3	--	Drench: 1 lb. 40 or 50% WP per 100 gal.	1 cup drench/plant	On soil where each transplant is set.	
	Diazinon	0.75	--				
Vegetable weevils (Listroderes spp.)	DDT	7	--	D, EC, or WP	1.2	On foliage as needed.	Do not apply DDT after curd begins to form.
	Parathion	1	7	D, EC, or WP	0.5		
	Rotenone (home garden only)	Exempt	1	D, EC, or powder	0.3		
Wireworms In West	DDT	7	--	EC, G, or WP	10	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. Apply DDT in fall or at least 6 weeks before planting. Soil temperature must be at least 50° F. when diazinon or parathion is applied.	After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not repeat soil application of DDT for at least 3 years.
	Diazinon	0.75	--	G	3 - 4		
	Parathion	1	--	G	4		
	Ethylene dibromide	10 (inorganic bromide)	--	83% soln. (12 lb. per gal.)	36	Inject 8 in. into fallow soil every 12 in.	Do not apply ethylene dibromide within 3 weeks before planting.

*Not effective in some areas.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CELERY							
Aphids	Demeton	0.75	28	EC	0.3 - 0.5	On foliage as needed.	Do not use demeton, mevinphos, or parathion in home garden; should be applied only by a trained operator.
	Diazinon	0.75	10	EC or WP	0.5		
	Malathion	8	7	D, EC, or WP	1.2		
	Mevinphos	1	3	D, EC, or WP	0.3 - 0.5		
	Naled	--	4	D or EC	1 - 2		
	Parathion	1	21	D, EC, or WP	0.5		Parathion is not effective at low temperatures.
Celery leaf tier (Udea rubigalis)	DDT	7	--	D, EC, or WP	1.2		Do not apply DDT or toxaphene after bunch begins to form or stalk is half grown, whichever is earlier.
	Parathion	1	21	D	0.5		
	Pyrethrum	Exempt	1	0.2% D EC	20 - 30 lb. D 0.5 oz.	2 applications one-half hour apart.	
Cutworms (soil)	DDT	7	--	D, EC, or WP	2	Broadcast on soil as needed.	
	*Toxaphene	7	--	D	2		
Lygus bugs	DDT	7	--	D, EC, or WP	1.2	On foliage as needed.	
	Pyrethrum	Exempt	1	0.2% D EC	20 - 30 lb. D 0.5 oz.		
Spider mites (Tetranychus spp.)	Demeton	0.75	28	EC	0.25		
	Malathion	8	7	D, EC, or WP	1.2		
	Parathion	1	21	D, EC, or WP	0.5		
Wireworms In West	DDT	7	--	EC or WP	10	Broadcast on soil and thoroughly work into upper 6 - 9 in. before planting. Soil temperature must be at least 50° F. when diazinon or parathion is applied.	Do not repeat soil application of DDT for at least 3 years. After applying parathion to soil, keep all persons and animals off treated area for 48 hours.
	Diazinon	0.75	--	G	3 - 4		
	Parathion	1	--	G	4		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CHARD (See Swiss chard)							
COLLARD							
Aphids	Diazinon	0.75	10	D EC or WP	0.5 - 1.0 0.5	On foliage when aphids appear; repeat weekly as needed.	Do not use mevinphos or parathion in home garden; should be applied only by a trained operator. Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 21 days after treatment.
	Malathion	8	7	D, EC, or WP	1.2		
	Mevinphos	1	3	D, EC, or WP	0.5		
	Naled	--	4	D or EC	1 - 2		
	Parathion	1	15	D, EC, or WP	0.3 - 0.5		
Caterpillars	Malathion (home garden only)	8	7	D, EC, or WP	1.2	On foliage every 7 days. On summer or autumn plantings in South begin when true leaves appear; on other plantings when insects appear. Insecticides may not control cabbage looper under all conditions. Apply to both sides of leaves when larvae are small.	
	Mevinphos	1	3	D, EC, or WP	0.5		
	Naled	--	4	D or EC	1 - 2		
	Parathion	1	15	D, EC, or WP	0.5		
	Toxaphene	7	35*	EC D or WP	2 - 3 3 - 4		
	Toxaphene + parathion	7 + 1	35*	D or WP	3 - 4 + 0.5 2 - 3** + 0.5		
Cutworms (soil)	DDT	7	21***	D, EC, or WP	2	On soil as needed.	
	Toxaphene	7	35*	D, EC, or WP	2		
				3% B	30 lb. B	Spread on soil (not plants) late in afternoon.	
Flea beetles	DDT	7	21***	D, EC, or WP	1.2	On foliage as needed.	
	Methoxychlor	14	14	D or WP	1.2		

*21 days if applied as a dust.

**More than 2.5 lb. per acre may cause plant injury if applied in low-gallonage emulsion spray. Use at least 50 gallons of water per acre when parathion is added to toxaphene emulsion.

***On plants intended for processing only; on others do not apply past seedling stage.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
COLLARD							
Harlequin bug (Murgantia histrionica) and stink bug	DDT	7	21*	D, EC, or WP	1.2	On foliage as needed.	Do not use parathion in home garden; should be applied only by a trained operator.
	Naled	--	4	EC	1.2		
Mole crickets	Chlordane	0.3	--	D, EC, G, or WP	1.5 - 2.0	Broadcast on soil of infested field.	Do not apply chlordane after thinning or transplanting.
				Drench: 4 oz. 40% WP/100 gal.	100 gal. drench per 1,000 sq. ft.	To surface of seed bed before planting.	
Root maggots	Chlordane	0.3	--	Drench: 1 lb. 40 or 50% WP/100 gal.	1 cup drench/plant	To soil where each transplant is set.	
	Diazinon	0.75	--				
Vegetable weevils (Listroderes spp.)	DDT	7	21*	D, EC, or WP	1.2	On foliage as needed.	Parathion is not effective at low temperatures. If maximum daily temperature below 70° F. persist after application, do not harvest for 21 days after treatment.
	Parathion	1	15	D, EC, or WP	0.5		
	Rotenone (home garden only)	Exempt	1	D, EC, or powder	0.3		
CORN (See Sweet corn)							
COWPEA (See Pea, blackeye)							
CUCUMBER, OUTDOOR							
Aphids	Diazinon	0.75	7	D EC or WP	0.8 - 1 0.5	On foliage as needed.	Do not use mevinphos in home garden; should be applied only by a trained operator.
	Endosulfan	2	1	D, EC, or WP	0.5 - 1		
	Malathion (home garden only)	8	1	D EC or WP	2.5 1.7		
	Mevinphos	0.25	1	D, EC, or WP	0.5		

Continued

*On plants intended for processing only; on others do not apply past seedling stage.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CUCUMBER, OUTDOOR							
Aphids (con.)	Naled	--	4	D or EC	1.5	On foliage as needed.	Do not use carbophenothion, endrin, or parathion in home garden; should be applied only by a trained operator. Do not apply parathion before vining.
	Parathion	1	15	D, EC, or WP	0.3 - 0.5		
Cucumber beetles (Diabrotica spp.)	Carbaryl	10	1	D or WP	1		
	Endosulfan	2	1	D, EC, or WP	0.5 - 1		
	Malathion	8	1	D, EC, or WP	1.7		
	Methoxychlor	14	1	D or WP	1 - 2		
	Parathion	1	15	D, EC, or WP	0.5		
Cutworms	Endrin	0	14	D, EC, or WP	0.25	On soil surface and foliage.	
Leaf miners	Diazinon	0.75	7	D EC or WP	0.8 - 1 0.5	On foliage as needed.	
	Naled (home garden only)	--	4	D or EC	1.5		
	Parathion	1	15	D, EC, or WP	0.5		
Pickleworm (Diaphania nitidalis)	Carbaryl*	10	1	D or WP	1	On foliage when worms appear in blossoms; repeat every week.	Do not use lindane in this manner in fields to be planted within 2 years to peanuts or root crops as it may adversely affect their flavor. Do not apply carbophenothion more than 3 times during fruiting period.
	Lindane*	10	1	D, EC, or WP	0.2 - 0.4		
Spider mites (Tetranychus spp.)	Carbophenothion	0.8	7	WP	0.25	On foliage as needed.	
	Dicofol	5	2	EC or WP D	10 oz. 1		
	Malathion	8	1	D, EC, or WP	1.0 - 1.7		
	Parathion	1	15	D, EC, or WP	0.3 - 0.5		
Thrips	Parathion	1	15	D, EC, or WP	0.3 - 0.5		

*When used with zineb or maneb every 5 days, reduce dosage of lindane or carbaryl by one-half.

CROP AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CUCUMBER, OUTDOOR							
Wireworms	Aldrin (in East)	0.25	--	EC, G, or WP	3	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in.	Do not repeat soil application of aldrin, chlordane, or DDT for at least 3 years.
	Chlordane (in East)	0.3	--	EC, G, or WP	4 - 8		
	DDT (in West)	7	--	EC, G, or WP	10		
	Ethylene dibromide (in West)	30 (inorganic bromide)	--	83% soln. (12 lb. per gal.)	36	Inject 8 in. into fallow soil every 12 in.	Do not apply ethylene dibromide within 3 weeks before planting.
CUCUMBER, LARGE GREENHOUSE*							
Aphids	Malathion	8	1	10% aerosol	1 lb. aerosol per 50,000 cu. ft.	In closed greenhouse in air above plants. Temperature should be 70°-85° F. and ventilators closed for at least 2 hours.	Do not use aerosols that contain parathion, tepp, or the propellant methyl chloride in greenhouses connected to living quarters; should be applied only by a trained operator.
	Parathion	1	15	10% aerosol			
	Tepp	0	3	5% aerosol			
Armyworms, cabbage looper (Trichoplusia ni), earwigs, and thrips	DDT	7	5	3% D	0.6	Dust into air above plants.	
	Malathion	8	1	10% aerosol	1 lb. aerosol per 50,000 cu. ft.	In closed greenhouse in air above plants. Temperature should be 70°-85° F. and ventilators closed for at least 2 hours.	Do not apply parathion before vining.
	Parathion	1	15				
Cucumber beetles (Diabrotica spp.)	Parathion	1	15	10% aerosol	1 lb. aerosol per 50,000 cu. ft.		
	DDT	7	5	3% D	0.6	Dust into air above plants.	
Cutworms	DDT	7	5	3% D	0.6	On soil surface.	
Garden symphylan (Scutigerella immaculata)	Lindane	10	--	Drench: 5 oz. 25% WP/50 gal.	50 gal./1,000 sq. ft.	Sprinkle on soil before watering. Put 1 pt. around base of each newly set plant	Use lindane only in greenhouse.

*Any greenhouse over 20,000 cu. ft. and not attached to living quarters.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CUCUMBER, LARGE GREENHOUSE*							
Greenhouse whitefly (Trialeurodes vaporariorum), mealybugs, and spider mites	Malathion	8	1	10% aerosol	1 lb. aerosol per 50,000 cu. ft.	In closed greenhouse in air above plants. Temperature should be 70°-85° F. and ventilators closed for at least 2 hours.	Do not use aerosols that contain parathion, tepp, or the propellant methyl chloride in greenhouses connected to living quarters; should be applied only by a trained operator. Do not apply parathion before vining.
	Parathion	1	15	10% aerosol			
	Tepp	0	3	5% aerosol			
Mushroom mite (Tyrophagus putrescentiae)	Parathion	1	15	10% aerosol			
	Tepp	0	3	5% aerosol			
Thrips	Malathion	8	1	10% aerosol			
	Parathion	1	15	10% aerosol			
	DDT	7	5	3% D	0.6	Dust into air above plants.	
CUCUMBER, SMALL GREENHOUSE**							
Aphids	Malathion	8	1	EC	2 tsp. EC/gal.	On foliage as needed.	
Caterpillars and earwigs	DDT	7	5	3% D	0.5 lb. D/1,000 sq.ft.	Dust into air above plants.	
	Malathion	8	1	EC	2 tsp. EC/gal.	On foliage as needed.	
Cucumber beetles (Diabrotica spp.)	DDT	7	5	3% D	0.5 lb. D/1,000 sq.ft.	Dust into air above plants.	
	Rotenone	Exempt	1	4% powder	4 tbsp. powder/gal.	On foliage as needed.	
Cutworms	DDT	7	5	3% D	0.5 lb. D/1,000 sq.ft.	On soil as needed.	
Garden symphylan (Scutigerella immaculata)	Lindane	10	--	Drench: 5 oz. 25% WP/50 gal.	50 gal./1,000 sq.ft.	Sprinkle on soil before watering. Put 1 pt. around base of each newly set plant.	Use lindane only in greenhouse.

*Any greenhouse over 20,000 cu. ft. and not attached to living quarters.
**Any greenhouse less than 20,000 cu. ft. or attached to living quarters.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CUCUMBER, SMALL GREENHOUSE*							
Greenhouse whitefly (Trialeurodes vaporariorum)	Malathion	8	1	EC	2 tsp. EC/gal.	On foliage as needed.	
	Rotenone	Exempt	1	4% powder	4 tbsp. powder/gal.		
Mealybugs	Malathion	8	1	EC	2 tsp. EC/gal.		
Spider mites (Tetranychus spp.)	Malathion	8	1	EC	2 tsp. EC/gal.		
Thrips and garden fleahopper (Halticus bracteatus)	DDT	7	5	3% D	0.5 lb. D/1,000 sq.ft.	Dust into air above plants.	
	Malathion	8	1	EC	2 tsp. EC/gal.	On foliage as needed.	
	Rotenone	Exempt	1	4% powder	4 tbsp. powder/gal.		
EGGPLANT							
Aphids	Endosulfan	2	1	D, EC, or WP	0.5	On foliage as needed.	Do not use parathion in home garden; should be applied only by a trained operator.
	Malathion	8	3	D, EC, or WP	1.7		
	Parathion	1	15	D, EC, or WP	0.5		
Colorado potato beetle (Leptinotarsa decemlineata)	Carbaryl	10	1	D or WP	2		
	DDT	7	5	D, EC, or WP	2		
	Endosulfan	2	1	D or EC	0.5		
	Naled	--	4	EC	1.5		
Cutworms	DDT	7	5	D, EC, or WP	2	On soil as needed.	
	Toxaphene	7	5	D, EC, or WP	2		
				3% B	40 lb. B	Scatter on soil (not plants) late in afternoon.	
Eggplant lace bug (Gargaphia solani)	Malathion	8	3	D, EC, or WP	1.2	On foliage as needed.	

*Any greenhouse less than 20,000 cu. ft. or attached to living quarters.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
EGGPLANT							
Flea beetles	Carbaryl	10	1	D or WP	1-2	On foliage as needed.	Do not use parathion in home garden; should be applied only by a trained operator.
	DDT	7	5	D, EC, or WP	1.2		
	Endosulfan	2	1	D or EC	0.5		
	Methoxychlor	14	1	D or WP	1.5		
Hornworms	Carbaryl	10	1	D or WP	1-2		
	TDE	7	1	D, EC, or WP	2-3		
Spider mites (Tetranychus spp.)	Malathion	8	3	D, EC, or WP	1.2		
Whiteflies	Endosulfan	2	1	D or EC	0.5		
	Parathion	1	15	D, EC, or WP	0.45		
Wireworms	Chlordane (in East)	0.3	--	EC, G, or WP	4-8	Broadcast on soil before planting and thoroughly work into upper 6-9 in. Apply DDT in fall or at least 6 weeks before planting. Soil temperature must be at least 50° F. when parathion is applied.	Do not repeat soil application of chlordane, DDT, or dieldrin for at least 3 years. After applying parathion to soil, keep all persons and animals off treated area for 48 hours.
	DDT (only on irrigated lands in West)	7	--	EC, G, or WP	10		
	Dieldrin (in East)	0.1	--	EC, G, or WP	3		
	Parathion	1	--	G	4		
	Ethylene dibromide (in West)	50 (inorganic bromide)	--	83% soln. (12 lb. per gal.)	36	Inject 8 in. into fallow soil every 12 in.	Do not apply ethylene dibromide within 3 weeks before planting.
HOP							
Aphids	Demeton	1.25	21	EC	0.5	On foliage as needed; about July 1.	Demeton or parathion should be applied only by a trained operator. Do not make more than 2 applications of naled.
	Diazinon	0.75	14	D, EC, or WP	1		
	Naled	--	4	EC	1		
	Parathion	1	15	D or EC	0.5		

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
HOP							
Spider mites (Tetranychus spp.)	Demeton	1.25	21	EC	0.5	On foliage as needed; about July 1.	Demeton or parathion should be applied only by a trained operator.
	Diazinon	0.75	14	D, EC, or WP	1		
	Dicofol	30	7	D EC	1.5 1.2		
	Tetradifon	30 fresh hops 120 dried hops	14	D, EC, or WP	1		Do not make more than 2 applications of tetradifon. Do not feed straw from tetradifon-treated fields to livestock.
	Parathion	1	15	D or EC	0.5		
Wireworms	DDT	--	--	EC, G, or WP	10	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in.	Do not repeat application of DDT for at least 3 years.
KALE							
Aphids	Diazinon	0.75	10	D EC or WP	0.5 - 1.0 0.5	On foliage when aphids appear; repeat weekly as needed.	
	Malathion	8	7	D, EC, or WP	1.2		
	Mevinphos	1	3	D or EC	0.5		Do not use mevinphos or parathion in home garden; should be applied only by a trained operator.
	Naled	--	4	D or EC	1 - 2		
	Parathion	1	15	D, EC, or WP	0.4 - 0.5		
Caterpillars	Malathion (home garden only)	8	7	D, EC, or WP	1.2	On foliage every 7 days. On summer or fall plantings in South begin when true leaves appear; on other plantings when insects appear. Insecticides may not control cabbage looper under all conditions. Apply to both sides of leaves when larvae are small.	Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 21 days after treatment.
	Mevinphos	1	3	D or EC	0.5		
	Naled	--	4	D or EC	1 - 2		
	Parathion	1	15	D, EC, or WP	0.5		
	Toxaphene	7	35*	D or WP EC	3 - 4 2 - 3		

*21 days if applied as a dust.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
KALE							
Cutworms (soil)	DDT	7	21*	D, EC, or WP	2	On soil as needed.	Do not use parathion in home garden; should be applied only by a trained operator.
	Toxaphene	7	35**	D, EC, or WP	2		
				3% B	0.9	Spread on soil (not plants) late in afternoon.	
Flea beetles	DDT	7	21*	D, EC, or WP	1.2	On foliage as needed.	
	Methoxychlor	14	14	D or WP	1.2		
Harlequin bug (Murgantia histrionica) and stink bug	DDT	7	21*	D, EC, or WP	1.2		
	Naled	--	4	EC	1.5		
Mole crickets	Chlordane	0.3	--	D, EC, G, or WP	1.5 - 2.0	Broadcast on soil of infested field.	Do not apply chlordane to plants past seedling stage.
				Drench: 4 oz. 40% WP/100 gal.	100 gal. drench per 1,000 sq. ft.	To surface of seed bed before planting.	
Root maggots	Chlordane***	0.3	--	D or WP	1.5	To soil at base of plants when leaves appear; repeat shortly after transplanting or thinning.	
	Diazinon	0.75	--	EC, G, or WP	2 - 3	Broadcast on soil before planting and thoroughly work into upper 3 - 4 in.	
	Chlordane***	0.3	--	Drench: 1 lb. 40 or 50% WP/100 gal.	1 cup drench/plant	On soil where each transplant is set.	
	Diazinon	0.75	--				
Vegetable weevils (Listroderes spp.)	DDT	7	21*	D, EC, or WP	1.2	On foliage as needed.	Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 22 days after treatment.
	Parathion	1	15	D, EC, or WP	0.5		
	Rotenone (home garden only)	Exempt	1	D, EC, or powder	0.3		

*On plants intended for processing; on others do not apply after seedling stage.

**21 days if applied as a dust.

***Not effective in some areas.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
KALE							
Wireworms In West	DDT	7	--	EC, G, or WP	10	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. Apply DDT at least 6 weeks before planting. Soil temperature must be at least 50° F. when diazinon or parathion is applied.	Do not use parathion in home garden; should be applied only by a trained operator. After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not repeat application of DDT for at least 3 years.
	Diazinon	0.75	--	G	3 - 4		
	Parathion	1	--	G	4		
KOHLRABI							
Aphids	Malathion	8	7	D, EC, or WP	1 - 1.2	On foliage when aphids appear; repeat weekly as needed.	Do not use parathion in home garden; should be applied only by a trained operator. Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 14 days after treatment. Do not apply DDT or toxaphene after appearance of plant parts to be eaten or marketed.
	Parathion	1	7	D, EC, or WP	0.5		
Caterpillars	Malathion (home garden only)	8	7	D, EC, or WP	1.2	On foliage every 7 days. On summer or fall plantings in South begin when true leaves appear; on other plantings when insects appear.	
	Parathion	1	7	D, EC, or WP	0.5		
	Toxaphene	7	30	D or WP	3 - 4		
				EC	2 - 3*		
Cutworms (soil)	DDT	7	--	D, EC, or WP	2	On soil as needed.	
	Toxaphene	7	30	D, EC, or WP	2		
				3% B	0.9	Spread on soil (not plants) late in afternoon.	
Flea beetles	DDT	7	--	D, EC, or WP	1.2	On foliage as needed.	
	Methoxychlor	14	1	D or WP	1.2		
Harlequin bug (Murgantia histrionica) and stink bug	DDT	7	--	D, EC, or WP	1.2		

*More than 2.5 lb. per acre may cause plant injury if applied in low-gallonage sprays.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
KOHLRABI							
Root maggots	Chlordane*	0.3	--	D, EC, or WP	1.5	To soil at base of plants when leaves appear; repeat shortly after transplanting or thinning.	Do not apply chlordane to plants past seedling stage.
				Drench: 1 lb. 40% WP/100 gal.	1 cup drench/plant	On soil where each transplant is set.	
LETTUCE, OUTDOOR							
Aphids on foliage	Demeton	0.75	21	EC	0.3 - 0.5	On foliage when aphids appear; repeat weekly as needed.	Do not use demeton, disulfoton, mevinphos, parathion, or tepp in home garden; should be applied only by a trained operator.
	Diazinon	0.75	10	D, EC, or WP	0.5		
	Endosulfan (head lettuce only)	2	14	D or EC	1		Do not apply endosulfan more often than 3 times after thinning. Remove outside leaves at harvest. Do not feed crop waste to livestock.
	Malathion	8	14**	D, EC, or WP	1 - 2		
	Mevinphos	0.5	3	D, EC, or WP	0.5		
	Naled	--	4	D or EC	1 - 2		
	Parathion	1	21***	D, EC, or WP	0.5		
	Tepp	0	3	D or EC	0.3 - 0.5		
	Disulfoton	0.75	60	G	1	Apply in seed furrow at planting time.	Parathion is not effective at low temperatures.
Cabbage looper (Trichoplusia ni) imported cabbageworm (Pieris rapae), and armyworms	Bacillus thuringiensis	Exempt	--	3% aqueous suspension concentrate****	2 - 3 qt. concentrate	On foliage as needed.	
				25 billions spores per gram WP	4 lb. WP		
	Endosulfan (head lettuce only)	2	14	D or EC	1		
	Malathion (home garden only)	8	14**	D, EC, or WP	1.2		

Continued

*Not effective in some areas.

**7 days on head lettuce.

***15 days on head lettuce when maximum temperatures are above 70° F.

****This is equivalent to 30 billion viable spores per gram of liquid concentrate.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
LETTUCE, OUTDOOR							
Cabbage looper (Trichoplusia ni), imported cabbageworm (Pieris rapae), and armyworms (con.)	Mevinphos	0.5	3	D or EC	0.5	On foliage as needed.	Do not use mevinphos or parathion in home garden; should be applied only by a trained operator.
	Naled	--	4	D or EC	1-2		
	Parathion	1	21*	D, EC, or WP	0.5		Parathion is not effective at low temperatures.
	Toxaphene	7	--	D or WP EC	4 2.5		
	Toxaphene + DDT (Southwest only)	7	--	D or EC	3 + 1		Do not apply DDT or toxaphene to head lettuce after heads begin to form, or to leaf lettuce after appearance of leaves that are to be eaten or marketed.
	Toxaphene + parathion	7 + 1	--	D or WP	4 + 0.4		
Corn earworm (Heliothis zea)	DDT	7	--	D, EC, or WP	1-2		
Cutworms (soil)	DDT	7	--	D, EC, or WP	2	On soil as needed.	
	Toxaphene	7	--	D, EC, or WP	2		
				3% B	0.9	Spread on soil (not plants) in late afternoon.	
Grasshoppers	Carbaryl	10	14**	D or WP	2	On seedlings as needed.	
	Malathion	8	14***	D, EC, or WP	1.5		
Leafhoppers	Carbaryl	10	14**	D or WP	2	On foliage as needed.	
	DDT	7	--	D, EC, or WP	1.2-2.5		
	Malathion	8	14***	D, EC, or WP	1.2		
	Methoxychlor	14	14	D or WP	1.2		
Mole crickets	Chlordane	0.3	--	D, EC, G, or WP	1.5-2.0	On soil as needed.	Do not apply chlordane to plants past seedling stage.
				Drench: 4 oz. 40% WP/100 gal.	100 gal. drench per 1,000 sq. ft.	To surface on seed bed before planting.	

*15 days on head lettuce when maximum temperatures are above 70° F.
**3 days on head lettuce.
***7 days on head lettuce.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
LETTUCE, OUTDOOR							
Wireworms							
In Southeast	DDT*	7	--	EC, G, or WP	20	Broadcast on soil before planting and thoroughly work into upper 4 - 6 in. with double-disk harrow.	Do not use parathion in home garden; should be applied only by a trained operator.
	Diazinon**	0.75	--	EC or WP	2		
	Parathion**	1	--	EC or WP	3		
In Northeast	Aldrin	0.25	--	EC, G, or WP	3	Broadcast on soil and thoroughly work into upper 6 - 9 in. before planting.	After applying parathion to soil, keep all persons and animals off treated area for 48 hours.
	Chlordane	0.3	--	EC, G, or WP	4 - 8		
	Dieldrin	0.25	--	EC, G, or WP	3		
In West	DDT	7	--	EC, G, or WP	10	Apply DDT at least 6 weeks before planting.	Do not repeat soil application of aldrin, chlordane, DDT, or dieldrin for at least 3 years.
	Diazinon**	0.75	--	G	3 - 4		
	Parathion**	1	--	G	4		
	Ethylene dibromide	30 (inorganic bromide)	--	83% soln. (12 lb. per gal.)	36	Inject 8 in. into fallow soil every 12 in. Soil temperature must be at least 45° F.	Do not apply ethylene dibromide within 3 weeks before planting.
LETTUCE, LARGE GREENHOUSE* **							
Aphids	Malathion	8	10	10% aerosol	1 lb. aerosol per 50,000 cu. ft.	In closed greenhouse in air above plants. Temperature should be 70°-85° F. and ventilators closed for at least 2 hours.	Do not use aerosols that contain parathion, tepp, or the propellant methyl chloride in greenhouses connected to living quarters; should be applied only by a trained operator.
	Parathion	1	21	10% aerosol			
	Tepp	0	3	5% aerosol			
Armyworms and cabbage looper (Trichoplusia ni)	DDT	7	--	3% D	0.6	Dust into air above plants.	
	Malathion	8	10	10% aerosol	1 lb. aerosol per 50,000 cu. ft.	In closed greenhouse in air above plants. Temperature should be 70°-85° F. and ventilators closed for at least 2 hours.	Do not apply DDT after appearance of leaves to be eaten or marketed.
	Parathion	1	21	10% aerosol			

*For southern potato wireworm only.

**Soil temperature must be at least 50° F. when diazinon or parathion is applied.

***Any greenhouse over 20,000 cu. ft. and not attached to living quarters.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
LETTUCE, LARGE GREENHOUSE*							
Cutworms (soil)	DDT	7	--	3% D	0.6	To soil surface.	Do not use aerosols that contain parathion, tepp, or the propellant methyl chloride in greenhouses connected to living quarters; should be applied only by a trained operator. Do not apply DDT after appearance of leaves to be eaten or marketed.
Greenhouse whitefly (Trialeurodes vaporariorum)	Malathion	8	10	10% aerosol	1 lb. aerosol per 50,000 cu. ft.	In closed greenhouse in air above plants. Temperature should be 70-85° F. and ventilators closed for at least 2 hours.	
	Parathion	1	21	10% aerosol			
	Tepp	0	3	5% aerosol			
Sowbugs	DDT	7	--	3% D	--	To soil surface.	
	Parathion	1	21	10% aerosol	1 lb. aerosol per 50,000 cu. ft.	In closed greenhouse in air above plants. Temperature should be 70-85° F. and ventilators closed for at least 2 hours.	
LETTUCE, SMALL GREENHOUSE**							
Aphids	Malathion	8	14	EC	2 tsp. EC/gal.	On foliage as needed.	Do not apply DDT after appearance of leaves to be eaten or marketed.
Caterpillars	DDT	7	--	3% D	--	Dust into air above plants.	
	Malathion	8	14	EC or WP	2 tsp. EC/gal.	On foliage as needed.	
Cutworms	DDT	7	--	10% D	--	To soil surface.	
Greenhouse whitefly (Trialeurodes vaporariorum)	Malathion	8	14	EC	2 tsp. EC/gal.	On foliage, 4 applications 7 days apart.	
	Rotenone	Exempt	1	4% powder	4 tbsp. powder/gal.		
Sowbugs	DDT	7	--	3% D	--	To soil surface.	
MELONS (See Cantaloup and Watermelon)							

*Any greenhouse over 20,000 cu. ft. and not attached to living quarters.

**Any greenhouse less than 20,000 cu. ft. or that is attached to living quarters.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
MINT							
Aphids	Malathion	8	7	D or EC	1	On foliage as needed.	Do not use parathion or tepp in home garden; should be applied only by a trained operator. Apply aldrin or dieldrin only before planting or just before fall or spring harrowing of old plantings. Do not feed mint hay or spent mint from DDT- or tetradifon-treated fields to livestock. After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not make more than 2 applications of tetradifon during the season.
	Tepp	0	3	D or EC	0.5		
Flea beetle larvae, white grubs, and wireworms	Aldrin*	--	--	D, EC, G, or WP	5	Broadcast on soil before planting and thoroughly work into upper 6 in.	
	Dieldrin*	0	--	EC, G, or WP	3		
Flea beetle adults	DDT	100 oil 50 hay	14	D or EC	2	Apply after adults emerge, usually in July.	
	Malathion	8	7	D or EC	1	On foliage as needed.	
Garden symphylan (Scutigerella immaculata)	Parathion	--	--	EC or WP	5	If 10 or more symphylans occur per shovel of soil, mix parathion in upper 4 - 6 in. before planting.	
Loopers	DDT	100 oil 50 hay	14	D or EC	2	On foliage as needed.	
	Malathion	8	7	D or EC	1		
Root weevils (Brachyrhinus spp.)	Malathion	8	7	EC	1		
Spider mites (Tetranychus spp.)	Malathion	8	7	D or EC	1		
	Tepp	0	3	D EC	0.5 0.4		
	Tetradifon	100	10	EC	0.6		
MUSKMELON (See Cantaloup)							

*Not effective against some species of wireworms.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
MUSTARD GREENS							
Aphids	Malathion	8	7	D, EC, or WP	1-1.2	On foliage when aphids appear; repeat weekly as needed.	Do not use mevinphos or parathion in home garden; should be applied only by a trained operator. Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 21 days after treatment. Do not apply toxaphene after appearance of leaves to be eaten or marketed.
	Mevinphos	1	3	D, EC, or WP	1-1.2		
	Naled	--	4	D or EC	1-2		
	Parathion	1	15	D, EC, or WP	0.5		
Caterpillars	Malathion (home garden only)	8	7	D, EC, or WP	1.2	On foliage every 7 days. In summer or fall plantings in South begin when plants appear; on other plantings when insects appear.	
	Mevinphos	1	3	D, EC, or WP	0.5		
	Naled	--	4	D or EC	1-2		
	Parathion	1	15	D, EC, or WP	0.5		
	Toxaphene	--	--	EC D or WP	2.5 3.7		
Cutworms	DDT	7	21*	D, EC, or WP	2	To soil as needed.	
	Toxaphene	--	--	D, EC, or WP	2		
				3% B	0.9	Spread on soil (not plants) in late afternoon.	
Flea beetles	DDT	7	21*	D, EC, or WP	1.2	On foliage as needed.	
	Malathion	8	7	D, EC, or WP	1-1.2		
Harlequin bug (Murgantia histrionica) and stink bug	DDT	7	21*	D, EC, or WP	1.2		
	Naled	--	4	EC	1.5		
Vegetable weevils (Listroderes spp.)	DDT	7	21*	D, EC, or WP	1.2		
	Parathion	1	15	D, EC, or WP	0.5		
	Rotenone (home garden only)	Exempt	1	D, EC, or powder	0.3		

*On plants intended for processing only; on others do not apply after seedling stage.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
OKRA							
Aphids	Malathion (home garden only)	--	--	D, EC, or WP	1.2	On foliage as needed.	Do not use mevinphos or parathion in home garden; should be applied only by a trained operator.
	Mevinphos	0.25	1	EC	0.5		
	Parathion	1	21	D, EC, or WP	0.5		
Blister beetles, caterpillars, cucumber beetles, flea beetles, Japanese beetle (Popillia japonica), and stink bugs	Carbaryl	10	1	D or WP	2		Do not apply malathion while pods are on plants.
	DDT	7	7	D, EC, or WP	1.2		
Leaf miners	Parathion	1	21	D, EC, or WP	0.5		
Wireworms	Ethylene dibromide	50 (inorganic bromide)	--	83% soln. (12 lb. per gal.)	36	Inject 8 in. deep into fallow soil every 12 in.	Do not apply ethylene dibromide within 3 weeks before planting.
ONION							
Leaf miners	Diazinon	0.75	10	D EC or WP	1.2 0.5	On foliage as needed.	Do not use carbophenothion or parathion in home garden; should be applied only by a trained operator.
	Parathion	1	15	D EC or WP	0.5 - 0.7 0.5		
Onion maggot (Hylemya antiqua) On green or dry onions	Diazinon	0.75	10	EC or WP	0.5	On foliage when flies appear. Repeat diazinon 10 - 14 days later. Apply malathion every 4 days.	
	Malathion	8	3	D, EC, or WP	1.5		
	Carbophenothion	0.8	--	G	In West use 0.8 oz. per 1,000 ft. row; in East use 0.4 oz.	Directly in seed furrow after seed has been dropped. Use separate hoppers for seed and chemical.	
	Ethion	1	--	G			
On dry onions only	Nemacide	--	--	G	1.5		

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ONION							
Onion thrips (Thrips tabaci)							
On green or dry onions	Diazinon	0.75	10	D EC or WP	1.2 0.5	On foliage of bulb crop every 10 - 14 days. On seed crop when heads first appear; repeat every 7 days.	Do not use mevinphos or parathion in home garden; should be applied only by a trained operator.
	Malathion	8	3	D EC or WP	2 0.75		
	Mevinphos	0.25 (green onions)	1	D, EC, or WP	0.5		
	Parathion	1	15	D EC or WP	0.5 - 0.7 0.25		
On dry onions only	DDT	7	--	D EC or WP	3 - 4 1.5	Use only DDT or toxaphene when plants are in bloom.	Do not apply DDT, dieldrin, or toxaphene on plants to be harvested as green or spring onions.
	Dieldrin	0.1	14	D, EC, or WP	0.5		
	Toxaphene	7	--	D EC or WP	5 2		
Wireworms	Chlordane (in East)	0.3	--	EC, G, or WP	4 - 8	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. Apply DDT at least 6 weeks before planting. Soil temperature should be at least 50° F. when diazinon or parathion is applied.	Do not repeat soil application of chlordane or DDT for at least 3 years. After applying parathion to soil, keep all persons and animals off treated area for 48 hours.
	DDT (only on irrigated lands in West)	7	--	EC, G, or WP	10		
	Diazinon	0.75	--	G	3 - 4		
	Parathion	1	--	G	4		
PEA, BLACKEYE							
Aphids	Malathion	8	3	D, EC, or WP	1.2	On foliage as needed.	Do not apply parathion in home garden; should be applied only by a trained operator. Do not feed plants treated with toxaphene to dairy animals or animals being finished for slaughter.
	Parathion	1	15	D, EC, or WP	0.5		
Cowpea curculio (Chalcodermus aeneus)	Toxaphene	7	7*	D, EC, or WP	3	On foliage at time of blooming; repeat in 3 and 6 days.	

*Do not apply after pods begin to form to peas to be used as green snaps.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
PEA, BLACKEYE							
Lygus bugs	Carbaryl	10	1	D or WP	2	On foliage when pods begin to form.	Do not use parathion in home garden; should be applied only by a trained operator.
	DDT	7	7*	D, EC, or WP	1-2		
	Toxaphene	7	7*	D, EC, or WP	3		
Wireworms	DDT (only on irrigated lands in West)	7	--	EC, G, or WP	10	Broadcast on soil and thoroughly work into upper 6-9 in. Apply DDT at least 6 weeks before planting. Soil temperature must be at least 50° F. when parathion is applied.	Do not feed plants treated with DDT or toxaphene to dairy animals or animals being finished for slaughter.
	Parathion	1	--	G	3 (in East) 4 (in West)		Do not treat soil for wireworms after planting.
							Do not repeat soil application of DDT for at least 3 years.
PEA, GARDEN							
Alfalfa looper (Anagrapha falcifera) and celery looper (Autographa californica)	Malathion + Perthane	8**	--	4% + 5% D	30 lb. D	On foliage as needed.	Do not use demeton, disulfoton, mevinphos, or parathion in home garden; should be applied only by a trained operator.
	Methoxychlor	14	7	D, EC, or WP	2		
Aphids	Demeton	0.75	21	EC	0.25		Do not apply Perthane after pods begin to form or feed treated plants to livestock.
	Diazinon	0.75 shelled peas 10 hay 25 green vines	4	D, EC, or WP	0.5		
	Malathion	8	3	D, EC, or WP	1-1.2		
	Mevinphos	0.25 peas 1 forage	1	D or EC	0.5		
	Naled	--	4	D or EC	1-2		
	Parathion	1	15***	D, EC, or WP	0.5		
	Disulfoton	0.75 peas 5 vines	--	G	1	In seed furrow at time of planting.	Do not apply disulfoton after planting.

*Do not apply after pods begin to form to peas to be used as green snaps.
**For malathion only; no tolerance for Perthane.
***10 days if plants are not to be fed to livestock.

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PEA, GARDEN							
Pea weevil (Bruchus pisorum)	DDT	7	--	D, EC, or WP	1-1.2	To foliage during early bloom period before eggs are laid. Repeat in 5 days.	Do not use parathion in home garden; should be applied only by a trained operator.
	Malathion	8	7*	D or EC	1-1.2		
	Methoxychlor	14	7	D or WP	1-1.5		Do not apply DDT to varieties with edible pods after blooms appear, or to plants to be fed to dairy animals or animals being finished for slaughter.
	Parathion	1	15**	D, EC, or WP	0.5		
Wireworms In West	DDT	7	--	EC or WP	10	Broadcast on soil before planting and thoroughly work into upper 6-9 in. Apply DDT at least 6 weeks before planting. Soil temperature should be at least 50° F. when diazinon or parathion is applied.	Do not treat soil for wireworms after planting. After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not repeat soil application of DDT for at least 3 years.
	Diazinon	0.75 shelled peas 10 hay 25 green vines	--	G	3-4		
	Parathion	1	--	G	4		
PEPPERS							
Aphids	Demeton	0.75	3	EC	0.38	On foliage as needed.	Do not use demeton or mevinphos in home garden; should be applied only by a trained operator. In California do not apply mevinphos with a hand sprayer or duster.
	Diazinon	0.75	5	EC D	0.25 1		
	Endosulfan	2	1	D EC or WP	1 0.5		
	Malathion (home garden only)	8	3	D, EC, or WP	1.5		
	Mevinphos	0.25	1	D or EC	0.5		
	Naled	--	4	D or EC	1-2		
Cutworms (soil)	DDT	7	5	D, EC, or WP	2	To soil as needed.	
	Toxaphene	7	5	D, EC, or WP	2		
				3% B	1.2	Spread on soil (not plants) late in afternoon.	

*3 days if plants are not to be fed to livestock.
**10 days if plants are not to be fed to livestock.

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PEPPERS							
European corn borer (Ostrinia nubilalis)	Carbaryl	10	1	D WP	1.5 1	On foliage as needed.	
	DDT	7	5	EC or WP	1		Wash peppers treated with DDT, TDE, or toxaphene in water containing a detergent (1 lb. per 50 gal.) and rinse in clean water.
Flea beetles	DDT	7	5	D or WP	1.2		
	Endosulfan	2	1	D EC or WP	1 0.5		
	Methoxychlor	14	1	D or WP	1.5		
Hornworms	DDT	7	5	D, EC, or WP	2-3		
	Endosulfan	2	1	D EC or WP	1 0.5		
	TDE	7	1	D, EC, or WP	2-3		
Leaf miners	Diazinon	0.75	5	D EC or WP	1 0.25		
	Naled (home garden only)	--	4	D or EC	1.5		
Pepper maggot (Zonosemata electa)	Endosulfan	2	1	D, EC, or WP	0.5		
	Malathion	8	3	D, EC, or WP	1.5		
Pepper weevil (Anthonomus eugenii)	DDT	7	5	D, EC, or WP	1.5-3.0	To infested foliage after weevils appear and repeat every 7-10 days.	
	Toxaphene	7	5	D, EC, or WP	3		
Spider mites	Dicofol	5	2	D, EC, or WP	12 oz.	On foliage as needed.	
Wireworms	Chlordane (in East)	0.3	--	EC, G, or WP	4-8	Broadcast on soil before planting and thoroughly work into upper 6-9 in.	Do not repeat soil application of chlordane or DDT for at least 3 years.
	DDT (only on irrigated lands in West)	7	--	EC, G, or WP	10	Apply DDT in fall or at least 6 weeks before planting.	

Continued

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
PEPPERS							
Wireworms (con.)	Diazinon	0.75	--	G	3 - 4	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. Soil temperature should be at least 50° F. when diazinon or parathion is applied.	Do not use parathion in home garden; should be applied only by a trained operator. After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not repeat soil application of dieldrin for at least 3 years. Do not apply ethylene dibromide within 3 weeks before planting.
	Dieldrin (in East)	0.1	--	EC, G, or WP	3		
	Parathion	1	--	G	4		
	Ethylene dibromide (in West)	30 (inorganic bromide)	--	83% soln. (12 lb./gal.)	36	Inject 8 in. into fallow soil every 12 in.	
POTATO							
Aphids In Northeast	Diazinon (home garden only)	--	14	D, EC, or WP	0.5	To foliage. Apply during last half of July and repeat if needed. Do not apply endosulfan except during warm, relatively calm weather.	Do not use disulfoton, endrin, or parathion in home garden; should be applied only by a trained operator. Do not apply endrin after cracks in the soil begin to expose the tubers. Do not feed tubers from endrin- or endosulfan-treated fields to dairy animals.
	Endosulfan	--	--	EC or WP	0.3 - 0.5		
	Endrin	0	3	EC	0.3 - 0.5		
	Malathion	8	--	EC or WP	0.3 - 0.5		
	Naled (home garden only)	--	--	D or EC	1 - 2		
	Parathion	--	5	D, EC, or WP	3 - 5 oz.		
	Disulfoton	0.75	75	G	1 - 2	Apply in fertilizer band or in planting furrow with special applicator attached to planter.	

Continued

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
POTATO							
Aphids (con.)							
In Northwest and Southwest	Demeton*	0.75	21	EC	0.5	To foliage. In Northwest apply to seed crop when aphids appear, and to table crop June 15 and repeat every 10-12 days to at least August 1. In Southwest apply as needed. Only endosulfan is recommended for aircraft applications.	Do not use demeton, disulfoton, endrin, or parathion in home garden; should be applied only by a trained operator.
	Diazinon (home garden only)	--	14	D, EC, or WP	0.5		
	Endosulfan	--	--	D or EC	1 lb. (0.5 lb. in Southwest and in coastal areas)		Do not feed tubers from fields treated with DDT, endosulfan, endrin, or toxaphene to dairy animals.
	Endrin	0	3	D or EC	9 oz.		
	Naled (home garden only)	--	--	D or EC	1-2		
	Disulfoton	0.75	75	G	3	To soil.**	Do not apply endrin after cracks in the soil begin to expose the tubers.
In Southeast	Diazinon	--	14	3% D EC or WP	0.8-1.0 0.4-0.5	Apply weekly as needed.	
	Endosulfan	--	--	D or WP EC	0.8-1.5 0.5-1.0		
	Endrin	0	3	D or EC	0.3-0.5		
	Naled (home garden only)	--	--	D or EC	1.5		
	Parathion	--	5	D, EC, or WP	0.3-0.5		
	Disulfoton	0.75	75	G	2-3	In furrow or as side-dressing at planting time.	
Armyworms	DDT	1	--	D, EC, or WP	1.5-2.0	To foliage. Migrating armyworms should be killed on nearby vegetation before they reach potato fields.	Do not feed nearby vegetation treated with DDT or toxaphene to poultry, dairy animals, or animals being finished for slaughter.
	Toxaphene	--	--	D or EC	1.5-2.0		

*Not effective in hot dry areas.

**Apply to soil in bands on both sides of row at planting time; except in long-season areas apply to early plantings as sidedressing after plants are up but not later than May 20. (In addition, 1 or more foliage applications of endosulfan may be needed in July or August in the Northwest.)

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
POTATO							
Blister beetles	DDT	1	--	D or WP EC	1.5 - 2.0 0.7 - 1.0	On beetles when present in damaging numbers. They usually occur in small sections of field.	Do not use azinphosmethyl or parathion in home garden; should be applied only by a trained operator.
	Naled	--	--	D or EC	1		
	Parathion	--	5	D, EC, or WP	0.5		
	Toxaphene	--	--	D EC	2.5 1.5 - 2.0		
Colorado potato beetle (Leptinotarsa decemlineata)							
In Northeast	Azinphosmethyl	--	7	EC	0.5	On foliage when 25% of stand is present and 7 days later.	
	Carbaryl	--	--	WP	0.8		
In Southeast	Carbaryl	--	--	D or WP	1 - 2	On foliage when eggs begin to hatch; repeat as needed.	Do not feed tubers from fields treated with DDT, endosulfan, or toxaphene to dairy animals.
	Endosulfan	--	--	D, EC, or WP	0.5 - 1.0		
	Naled	--	--	D or EC	1		
In West	Carbaryl	--	--	D	1 - 1.5	On foliage when beetles become abundant in the spring, or shortly after eggs hatch and, if needed, 10 - 14 days later.	
	Endosulfan	--	--	EC	1		
Cucumber beetles (Diabrotica spp.)							
Adults	Carbaryl	--	--	D or WP	1	On foliage as needed.	
	DDT	1	--	D or WP EC	1 - 1.5 0.5 - 1		
	Naled	--	--	D or EC	1		
Cutworms	DDT	1	--	D, G, or WP EC	2 1	To soil and foliage when cutworms appear.	

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
POTATO							
European corn borer (Ostrinia nubilalis)	DDT	1	--	D EC or WP	2 1	On foliage as needed; in New England each week of June and August.	Do not use dichloropropane-dichloropropene mixture, endrin, parathion, or Telone in home garden; should be applied only by a trained operator. Do not apply endrin after cracks in the soil begin to expose the tubers. Do not feed tubers from fields treated with DDT, dieldrin, endosulfan, endrin or toxaphene to dairy animals. After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not feed nearby vegetation treated with toxaphene to poultry, dairy animals, or animals being finished for slaughter.
	Endrin	0	3	EC	0.25		
False chinch bug (Nysius ericae)	Endosulfan	--	--	EC	1	On foliage of infested plants.	
	Malathion	8	--	D, EC, or WP	1		
Flea beetles (Epitrix spp.) Adults	Carbaryl	--	--	D or WP	0.5 - 0.8	On foliage. In Southeast as needed; elsewhere when 25% of stand is present and 7 days later.	
	DDT*	1	--	D or WP EC	1.5 0.7 - 1.0		
	Dieldrin*	0.1	3	D, EC, or WP	0.5		
	Endosulfan*	--	--	D or EC	0.5 - 1.0		
	Endrin*	0	3	D or EC	5 - 9 oz.		
Garden symphylan (Scutigerella immaculata)	Parathion	--	--	EC or WP	5	Broadcast on soil surface before planting and thoroughly work into upper 6 in.	
	Dichloropropane-dichloropropene mixture	--	--	Fumigant	300	Inject 8 in. deep into fallow soil every 12 in. at least 3 weeks before planting. Do not apply to extremely heavy soil or soil when very wet or very dry.	
	Telone	--	--	Fumigant	300		
Grasshoppers	Malathion	8	--	D EC or WP	0.38 0.8	To nearby vegetation before insects reach potato fields; repeat as needed.	
	Toxaphene	--	--	D EC or WP 1% B	2.5 1.5 0.2		
Leafhoppers	DDT	1	--	D or WP EC	1 - 1.5 0.7 - 1.0	On foliage when leafhoppers first appear; repeat every 10 days as needed.	
	Endosulfan**	--	--	EC	0.5 - 1.0		

Continued

*Not always effective in some areas.

**Not always effective in Northeastern and North Central states.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
POTATO							
Leafhoppers (con.)	Malathion	8	--	EC	0.5 - 1.0	On foliage when leafhoppers first appear; repeat every 10 days as needed.	Do not use azinphosmethyl, disulfoton, endrin, or parathion in home garden; should be applied only by a trained operator. Do not feed tubers from fields treated with chlordane, DDT, endosulfan, or endrin to dairy animals.
	Methoxychlor	--	--	WP	2.2		
	Parathion	--	5	D, EC, or WP	0.3 - 0.5		
	Disulfoton	0.75	75	G	3	Same as for aphids.	
Leaf miners (Liriomyza spp.)	Azinphosmethyl	--	7	D EC or WP	0.5 - 0.6 0.4 - 0.5	On foliage as needed.	
	Diazinon	--	14	EC or WP	0.4 - 0.5		
	Parathion	--	5	D, EC, or WP	0.5		
Millipedes	DDT	1	--	D	3	On foliage or soil surface as needed.	
Mole crickets	Chlordane	0.3	--	D, EC, G, or WP	2	Broadcast on soil surface before planting.	
Plant bugs (including shield-shaped bugs)	DDT	1	--	D or WP EC	1.5 - 2.0 0.5 - 1.0	On foliage as needed.	
	Endosulfan	--	--	EC	0.5 - 1.0		
	Parathion	--	5	D, EC, or WP	4 - 8 oz.		
Potato psyllid (Paratrioza cockerelli)	DDT	1	--	D EC or WP	1 - 1.7 1	On foliage when 1 adult is found per 100 sweeps; repeat every 2 weeks 4 or 5 times.	
	Parathion	--	5	D	0.25 - 0.5		
	Disulfoton	0.75	75	G	2.5 - 3.0	Apply in soil in bands on both sides of row at planting time.	
Potato tuberworm (Phthorimaea operculella) In field	Azinphosmethyl	--	7	D, EC, or WP	0.5	On foliage when tuberworms begin to web leaves together; repeat in 10 days.	
	DDT	1	--	EC	1		
	Endosulfan	--	--	D or EC	0.5 - 1.0		
	Endrin	0	3	EC	6 oz.		

Continued

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CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
POTATO							
Potato tuberworm (Phthorimaea operculella) (con.) In seed storage	DDT	1	--	5% D	1.5 - 2 oz./100 lb. tubers	On tubers when put in storage.	Do not use carbophenothion or parathion in home garden; should be applied only by a trained operator.
	Methoxychlor	--	--	5% D	1.5 - 2 oz./100 lb. tubers		
Slugs	Metaldehyde + chlordane	None + 0.3	--	2.5% + 5% B	0.25 + 0.5	Broadcast on soil late in day when damage is observed.	Do not use for food or feed tubers treated with DDT or methoxychlor after harvest.
	Metaldehyde + calcium arsenate	None	--	2.5% + 5% B	0.25 + 0.5		
Southern potato wireworm (Conoderus falli)	Diazinon	--	--	EC, G, or WP	1.5 - 2.0	Broadcast on soil and immediately work thoroughly into upper 4 - 6 inches with double-disk harrow. See Leaflet 534, p. 5.	Do not make soil treatments with diazinon and parathion after planting. After applying parathion to soil, keep all persons and animals off treated area for 48 hours.
	Parathion	--	--	EC, G, or WP	3		
Spider mites (Tetranychus spp.)	Carbophenothion (Northwest only)	--	--	EC	1	On foliage as needed.	Do not feed tubers from fields treated with DDT, dicofol, or endosulfan to dairy animals.
	Dicofol	--	--	EC	1		
	Dicofol + sulfur	--	--	4% + 50% D	1.4 + 18		
	Parathion + sulfur	--	5	2% + 50% D	0.7 + 18		
Three-lined potato beetle (Lema trilineata)	Carbaryl	--	--	WP	0.5		
	DDT	1	--	D or WP EC	1.5 - 2.0 0.7 - 1.0		
	Endosulfan	--	--	EC	0.5		
Thrips	DDT	1	--	D EC	1 - 1.5 0.7 - 1.0		
	Endosulfan	--	--	EC	1		
	Parathion	--	5	D, EC, or WP	0.3 - 0.5		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
POTATO							
Vegetable weevils (Listroderes spp.)	DDT	1	--	D or WP EC	1.5 0.75	On foliage as needed.	Do not use parathion in home garden; should be applied only by a trained operator. Do not feed tubers from fields treated with chlordane, DDT, dieldrin, or endosulfan to dairy animals.
	Dieldrin	0.1	3	D, EC, or WP	0.3 - 0.5		
	Parathion	--	5	D, EC, or WP	0.5		
Whiteflies	DDT	1	--	D or WP EC	1.5 1	On foliage when adults become abundant.	
	Dieldrin	0.1	3	D or EC	0.5		
	Endosulfan	--	--	EC	0.5 - 1.0		
White-fringed beetles (Graphognathus spp.) Grubs	Chlordane	0.3	--	EC, G, or WP	5	Broadcast on soil before planting and thoroughly work into upper 3 in.	Do not make soil treatments after planting. Do not repeat soil application of chlordane or DDT for at least 3 years.
	DDT	1	--	EC, G, or WP	10		
White grubs	Chlordane	0.3	--	EC, G, or WP	4 - 10	Broadcast on soil before planting and thoroughly work into upper 4 - 6 in.	
	DDT	1.0	--	EC, G, or WP	10		
Wireworms* In East	Chlordane	0.3	--	EC, G, or WP	4 - 8	Broadcast on soil and thoroughly work into upper 4 - 6 in.	
	Diazinon	--	--	EC, G, or WP	1.5 - 2.0		
In West	DDT	1	--	EC, WP, or 10 - 15% G	10	Broadcast on soil and thoroughly work into upper 6 - 9 in. Apply DDT in the fall or 3 months before planting.	
	Diazinon	--	--	G	3 - 4	Broadcast on soil and immediately work into upper 6 - 9 in. before planting. Soil temperature must be at least 50° F. when diazinon or parathion is applied.	After applying parathion to soil, keep all persons and animals off treated area for 48 hours.
	Parathion	--	--	G	4		

Continued

*Except southern potato wireworm in South where it is resistant to chlordane. See control for this insect on page 146.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
POTATO							
Wireworms* In West (con.)	Dichloropropane-dichloropropene mixture	--	--	Fumigant	250	Inject 8 in. deep into fallow soil every 12 in. at least 3 weeks before planting. Soil temperature must be between 45° and 90° F. at 6 in. depth. Do not apply to extremely heavy soil or soil when very wet or very dry.	Do not use dichloropropane-dichloropene mixture or Telone in home garden; should be applied only by a trained operator.
	Ethylene dibromide	75 (inorganic bromide)	--	83% soln. (12 lb./gal.)	36		
	Telone	--	--	Fumigant	200		
PUMPKIN							
Aphids	Endosulfan	2	1	D EC or WP	1 0.5	On foliage as needed.	Do not use parathion in home garden; should be applied only by a trained operator. Do not apply parathion before vining.
	Malathion (home garden only)	8	3	D, EC, or WP	1.7		
	Parathion	1	10	D or WP	0.3 - 0.5		
Cucumber beetles (Diabrotica spp.)	Carbaryl	10	1	D or WP	1		
	Malathion	8	3	D, EC, or WP	1.7		
	Methoxychlor	14	1	D or WP	1.5		
	Parathion	1	10	D, EC, or WP	0.5		
Cutworms	DDT (home garden only)	7	5	D, EC, or WP	2	To soil surface.	
	Parathion	1	10	D or WP	0.3 - 0.5		
	Toxaphene	--	--	D, EC, or WP	2	To soil surface (not on plants.)	Do not apply toxaphene after edible parts start to form; may be injurious to plant growth.
				3% B (home garden only)	1.2	Scatter on soil (not plants) late in afternoon.	

*Except southern potato wireworm in South where it is resistant to chlordane. See control for this insect on page 146.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
PUMPKIN							
Squash bug (Anasa tristis)	Carbaryl	10	1	D or WP	1	On foliage as needed.	Do not use parathion in home garden; should be applied only by a trained operator. Do not apply parathion before vining. Do not use lindane in this manner in fields to be planted within 2 years to root crops or peanuts as it may adversely affect their flavor.
	Parathion	1	10	D, EC, or WP	0.5		
Squash vine borer (Melittia cucurbitae)	Carbaryl	10	1	D or WP	1	Once or twice a week to stems and vines at base of plants.	
	Endosulfan	2	1	D EC or WP	1 0.5		
	Lindane	10	1	D or WP	0.5		
	Naled	--	7	D or EC	1.5		
RUTABAGA							
Aphids	Malathion	8	3	D, EC, or WP	1.2	On foliage when aphids appear; repeat weekly as long as needed.	Do not use parathion or tepp in home garden; should be applied only by a trained operator. Do not use foliage treated with DDT or toxaphene for food or feed. Do not repeat soil application of dieldrin for at least 3 years. Do not feed rutabaga roots or foliage from fields treated with DDT or dieldrin to dairy animals.
	Parathion	1	7	D, EC, or WP	0.5		
	Tepp	0	3	D or EC	0.5		
Cabbage looper (Trichoplusia ni)	Malathion	8	3	D, EC, or WP	1.2	On foliage every 7 days. On summer or fall plantings in South begin when true leaves appear; on others when insects appear.	
	Parathion	1	7	D, EC, or WP	0.5		
	Toxaphene	7	--	D, EC, or WP	2 - 3		
Cutworms	DDT	7	--	D, EC, or WP	2	To soil surface.	
	Toxaphene	7	--	D, EC, or WP	2		
Flea beetles	DDT	7	--	D, EC, or WP	1.2	On foliage as needed.	
	Methoxychlor	14	7	D or WP	1.5		
Root maggots	Dieldrin*	0.25	--	EC or WP	2 - 3	Broadcast on soil surface before planting and thoroughly work into upper 3 - 4 in.	
	Diazinon	--	--	EC, G, or WP	1		

*Not effective in some areas.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
RUTABAGA							
Wireworms	DDT (only on irrigated lands in West)	7	--	EC or WP	10	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. Apply DDT at least 6 weeks before planting. Soil temperature must be at least 50° F. when parathion is applied.	Do not use parathion in home garden; should be applied only by a trained operator. After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not repeat soil application of DDT for at least 3 years. Do not feed rutabaga roots or foliage from fields treated with DDT to dairy animals.
	Parathion	1	--	G	4		
SPINACH							
Alfalfa looper (Autographa californica)	DDT	7	--	D, EC, or WP	2.5	On foliage as needed.	Do not use disulfoton, mevinphos, or parathion in home garden; should be applied only by a trained operator. Do not apply DDT after seedling stage. Do not apply toxaphene more than once per season. Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 21 days after treatment. Do not apply disulfoton after planting.
	Malathion + Perthane	8 + 15	14	4% + 5% D	1.2 + 1.5		
	Methoxychlor	14	14	D or WP	1.2		
	Toxaphene	7	21	D	2		
Aphids	Diazinon	0.75	14	D, EC, or WP	0.4 - 0.5		
	Malathion	8	7	D, EC, or WP	1.7		
	Mevinphos	1	4	D, EC, or WP	0.5		
	Naled	--	4	D or EC	1.5		
	Parathion	1	14	D, EC, or WP	0.5		
	Disulfoton	0.75	--	G	1	Apply in seed furrow at planting time.	
Beet webworm (Loxostege sticticalis)	DDT	7	--	D, EC, or WP	1.5	On foliage as needed.	
	Malathion	8	7	D, EC, or WP	1.7		
	Pyrethrum	Exempt	1	0.2% D EC	20 - 30 lb. D 0.5 oz.		

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SPINACH							
Spinach leaf miner (Pegomya hyoscyami)	Diazinon	0.75	14	D, EC, or WP	0.3 - 0.5	On foliage as needed.	Do not use parathion in home garden; should be applied only by a trained operator. Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 21 days after treatment. Do not repeat soil application of DDT for at least 3 years.
	Naled (home garden only)	--	4	D or EC	1.5		
	Parathion	1	14	D, EC, or WP	0.5		
Wireworms	DDT (only on irrigated lands in West)	7	--	EC or WP	10	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. Apply DDT at least 6 weeks before planting. Soil temperature must be at least 50° F. when diazinon is applied.	
	Diazinon	0.75	--	G	2 in East 4 in West		
SQUASH							
Aphids	Diazinon	0.75	7*	D EC	1 0.5	On foliage as needed.	Do not use parathion in home garden; should be applied only by a trained operator.
	Endosulfan	2	1	D, EC, or WP	0.5 - 1.0		
	Malathion (home garden only)	8	1	D, EC, or WP	1.7		
	Naled	--	7**	D or EC	1.5		
	Parathion	1	15	D, EC, or WP	0.3 - 0.5		Do not apply parathion before vining.
Cucumber beetles (Diabrotica spp.)	Carbaryl	10	1	D or WP	0.5 - 1.0		
	Endosulfan	2	1	D, EC, or WP	0.5 - 1.0		
	Malathion	8	1	D, EC, or WP	1.7		
	Methoxychlor	14	1	D or WP	1.5		
	Parathion	1	15	D, EC, or WP	0.25		
Cutworms	DDT (home garden only)	7	5	D, EC, or WP	2	On soil surface, not plants.	

Continued

*3 days on winter squash.
**4 days on summer squash.

CROP AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m.)*	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SQUASH							
Cutworms (con.)	Carbaryl	10	1	D or WP	0.5-1.0	On foliage as needed.	Do not use parathion in home garden; should be applied only by a trained operator. Do not apply parathion before vining.
	Parathion	1	15	D, EC, or WP	0.25		
	Toxaphene	--	--	D, EC, or WP	2	On soil before planting.	
Leaf miners	Diazinon	0.75	7*	D EC	1 0.5	On foliage as needed.	
	Naled (home garden only)	--	7**	D or EC	1.5		
	Parathion	1	15	D, EC, or WP	0.5		
Pickleworm (Diaphania nitidalis)	Carbaryl	10	1	D or WP	1	On foliage when worms appear in blossoms; repeat every week.	Do not use lindane in this manner in fields to be planted within 2 years to root crops or peanuts, as it may adversely affect their flavor.
	Lindane	10	1	D, EC, or WP	0.25		
Squash bug (Anasa tristis)	Carbaryl	10	1	D or WP	1	On foliage as needed.	
	Parathion	1	15	D, EC, or WP	0.5		
Squash vine borer (Melittia cucurbitae)	Carbaryl	10	1	D or WP	1	Weekly to flower buds, stems, and vines beginning when moths first appear.	
	Endosulfan	2	1	D EC or WP	1 0.5		
	Lindane	10	1	D, EC, or WP	0.25		
	Naled	--	7**	D or EC	1.5		

*3 days on winter squash.
**4 days on summer squash.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SWEET CORN							
Corn earworm (Heliothis zea) and fall armyworm (Spodoptera frugiperda)	Carbaryl	5 corn* 100 fodder or forage	--	WP	1.5 lb./25 gal.	Apply in 25 gallons of water per acre to larvae at a pressure of 100 - 140 lb./sq. in. On young plants direct spray into whorls of plant. As soon as silks appear, wet silks thoroughly at 1- or 2-day intervals.	Do not use EPN in home garden; should be applied only by a trained operator. Do not feed forage, including ensilage, from plants treated with DDT or toxaphene to dairy animals or animals being finished for slaughter.
	DDT	3.5 corn*	--	EC	For corn earworm 2 lb./25 gal. For fall armyworm 1 - 2 lb./25 gal.		
Corn sap beetle (Carpophilus dimidiatus)	Malathion (home garden only)	2 corn* 8 forage	5	EC	1	6 days after silks appear and repeat 10 days later.	
European corn borer (Ostrinia nubilalis)	Carbaryl	5 corn* 100 fodder or forage	--	WP or G	1.5	When borers start hatching and at 5-day intervals if necessary.	
	DDT	3.5 corn*	--	D EC G	2 1.5 1		
	Diazinon	0.75 corn* 40 forage	--	G	1		Corn treated with diazinon may be picked immediately after last application.
	EPN	3	14	G WP	0.2 0.25		
	Ryania	Exempt	--	40% D	1.2 - 1.6		
	Toxaphene	7	--	G	2		
Japanese beetle (Popillia japonica)	Carbaryl	5 corn* 100 fodder or forage	--	WP	1	On silks and foliage.	
	DDT	3.5 corn*	--	D, EC, or WP	1.5		
	Methoxychlor	14	7	D, EC, or WP	1.5		

*Kernels and kernels plus cob, determined after removing husks present when marketed.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SWEET CORN							
Rootworms	Aldrin	0	--	EC, G, or fertilizer mixture	1 - 2	Minimum dosage to soil in row or hill when planting; maximum broadcast before planting and immediately work into upper 3 in. Apply diazinon in the furrow only when planting.	Do not use parathion or phorate in home garden; should be applied only by a trained operator.
	Chlordane	--	--	EC, G, or fertilizer mixture	1 - 1.5		
	Diazinon*	0.75 corn** 40 forage	--	G	1		
	Heptachlor	--	--	EC, G, or fertilizer mixture	1 - 2		Do not apply heptachlor to soils where hops may be grown as it may adversely affect the hop plant.
	Parathion*	1	--	G	1		
	Phorate*	0	--	G	1		
Wireworms	Aldrin	--	--	EC or G	1.5 - 2		
SWEETPOTATO							
Cucumber beetle (Diabrotica spp.) and flea beetles	DDT	7	--	EC, G, or WP	20	Broadcast on soil and thoroughly work into upper 4 - 6 in. at least 6 weeks before planting.	Do not feed sweetpotato byproducts or culls from fields treated with chlordane, DDT, or dieldrin to dairy animals or animals being finished for slaughter. Do not repeat broadcast soil application of chlordane, DDT, or dieldrin for at least 3 years.
Sweetpotato weevil (Cylas formicarius elegantulus)	Dieldrin	0.1	21	2% D	75 lb. D in one or 40 lb. in each of two applications	To soil at base of plants in strips 6 - 8 in. wide when roots begin to enlarge.	
Wireworms In Southeast	Chlordane***	0.3	--	EC, G, or WP	4 - 6	Broadcast on soil before planting and thoroughly work into upper 4 - 6 in. Apply DDT in fall or at least 6 weeks before planting.	
	DDT****	7	--	EC, G, or WP	20		
	Dieldrin***	0.1	--	EC, G, or WP	2		
	Diazinon	--	--	G	3	Broadcast on foliage when roots begin to enlarge.	

Continued

*Use when rootworms have developed resistance to other insecticides.

**Kernels and kernels plus cob determined after removing husks present when marketed.

***Not effective against southern potato and tobacco wireworms.

****For southern potato wireworm only.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SWEETPOTATO							
Wireworms (con.) In Southwest	DDT	7	--	EC, G, or WP	10	Broadcast on soil and thoroughly work into upper 6 - 9 in. at least 6 weeks before planting.	Do not feed sweetpotato byproducts or culls from fields treated with DDT to dairy animals or animals being finished for slaughter. Do not repeat soil application of DDT for at least 3 years.
SWISS CHARD							
Aphids	Diazinon	0.75	12	D EC or WP	0.4 - 1.0 0.4 - 0.5	On foliage when aphids appear; repeat weekly as needed.	Do not use parathion or tepp in home garden; should be applied only by a trained operator. Parathion is not effective at low temperatures.
	Malathion	8	7	D, EC, or WP	1.2		
	Naled	--	4	D or EC	1.5		
	Parathion	1	21	D, EC, or WP	0.5		
	Tepp	0	3	D or EC	0.5		
Beet webworm (Loxostege sticticalis)	Pyrethrum	Exempt	1	D or EC	0.5 oz.	On foliage as needed.	
Flea beetles	Rotenone	Exempt	1	D or powder	0.3		
TOMATO, OUTDOOR							
Aphids	Demeton	0.75	3	EC	4 - 6 oz.	On foliage as needed.	Do not use demeton, endrin, mevinphos, or parathion in home garden; should be applied only by a trained operator.
	Diazinon	0.75	3	D EC or WP	0.75 0.3 - 0.5		
	Endrin	0	14	D or EC	0.3 - 0.5		
	Malathion	8	1	D, EC, or WP	1.2		
	Mevinphos	0.25	1	D, EC, or WP	0.5		
	Naled	--	4	D or EC	1		Parathion is not effective at low temperatures.
	Parathion	1	10	D, EC, or WP	0.5		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
TOMATO, OUTDOOR							
Armyworm (See Tomato fruitworm)							
Blister beetles	DDT	7	5	D	3	On beetles.	Do not use azinphosmethyl, mevinphos, or parathion in home garden; should be applied only by a trained operator.
	Endosulfan	2	1	D or EC	1		
	Methoxychlor	14	1	D or WP	1.7		
	Naled	--	4	D or EC	1		
	Toxaphene	7	3	D	5		
Cabbage looper (Trichoplusia ni)	Bacillus thuringiensis	Exempt	--	3% aqueous suspension concentrate*	2 - 3 qt. concentrate	On foliage as needed.	
				25 billion spores per gram WP	4 lb. WP		
	Azinphosmethyl	2	1	D, EC, or WP	0.75		
	Endosulfan	2	1	D or EC	0.75		
	Mevinphos	0.25	1	D, EC, or WP	0.5		
	Naled	--	4	D or EC	1		
	Toxaphene + parathion	7 + 1	10	D or WP	4 + 0.5		Parathion is not effective at low temperatures.
Colorado potato beetle (Leptinotarsa decemlineata)	Carbaryl	10	1	D or WP	1 - 2		
	DDT	7	5	D, EC, or WP	1.5		
	Endosulfan	2	1	D or EC	1		
	Naled	--	4	EC	1		
Cutworms (soil)	DDT	7	5	D, EC, or WP	2	To soil as needed.	
	Toxaphene	7	3	D, EC, or WP	2		
				3% B	1.2	Scatter on soil (not plants) in late afternoon.	

*This is equivalent to 30 billion viable spores per gram of liquid concentrate.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
TOMATO, OUTDOOR							
Drosophila (Drosophila melanogaster)	Aldrin	0.1	1	D, EC, G, or WP	0.5	On foliage and fruit as needed.	Do not use azinphosmethyl, dichloropropane-dichloropropene mixture, parathion, or Telone in home garden; should be applied only by a trained operator.
	Diazinon	0.75	1	G D, EC, or WP	1 0.75		
	Malathion	8	1	D, EC, or WP	2		
	Pyrethrins + piperonyl butoxide	1 + 8	--	0.1% D	0.5 - 1 lb. D/ton of fruit	On fruit immediately after harvest.	
Flea beetles	Carbaryl	10	1	D or WP	1 - 2	On foliage as needed.	
	DDT	7	5	D, EC, or WP	1 - 1.5		
	Endosulfan	2	1	D, EC, or WP	1		
	Toxaphene	7	3	D	3		
Garden symphylan (Scutigerella immaculata)	Parathion	1	--	G or WP	5	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in.	After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not apply dichloropropane-dichloropropene mixture or Telone within 3 weeks before planting. Do not apply to extremely heavy soil or soil when very wet or very dry.
	Dichloropropane-dichloropropene mixture	--	--	Fumigant	300	Inject 8 in. deep into fallow soil every 12 in.	
	Telone	--	--	Fumigant	300		
Hornworms	Carbaryl	10	1	D or WP	2 - 4	On foliage as needed.	
	Endosulfan	2	1	D, EC, or WP	1		
	TDE	7	1	D, EC, or WP	2 - 3		
	Toxaphene	7	3	D	3		
Leaf miners (Liriomyza spp.)	Azinphosmethyl	2	1	D, EC, or WP	0.5 - 0.75		
	Diazinon	0.75	3	D EC or WP	0.75 0.5		
	Naled (home garden only)	--	4	D or EC	1		
Continued	Parathion	1	10	D, EC, or WP	0.5		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
TOMATO, OUTDOOR							
Leaf miners (Liriomyza spp.) (con.)	Disulfoton	0.75	30	G	2	In furrow at time of planting. Sidedress once after plant emergence.	Do not use carbophenothion, demeton, disulfoton, or parathion in home garden; should be applied only by a trained operator.
Spider mites (Tetranychus spp.)	Carbophenothion	0.8	7	D, EC, or WP	1	On foliage as needed.	
	Demeton	0.75	3	EC	4 - 6 oz.		
	Dicofol	5	2	D EC or WP	1 9 oz.		
	Malathion	8	1	D, EC, or WP	1.2		
	Parathion	1	10	D, EC, or WP	0.5		
Stalk borer (Papaipema nebris)	DDT (home garden only)	7	5	D, EC, or WP	1 - 1.5		
Stink bugs	Carbaryl	10	1	D or WP	2 - 4		
	DDT	7	5	D, EC, or WP	1 - 1.5		
	Endosulfan	2	1	D or EC	1		
	Naled (home garden only)	--	4	D or EC	1		
Tomato fruitworm (Heliothis zea), tomato pinworm (Keiferia lycopersicella), armyworms, and climbing cutworms	Cryolite*	7 (fluorine)	--	Bait (1 lb. in 10 lb. corn meal)*	5.5	Scatter evenly over foliage. Time as for dusts.	
	Carbaryl	10	1	D or WP	2	On foliage when fruits of main crop are setting; repeat in 2 and 4 weeks.	
	DDT	7	5	D, EC, or WP	3		
	TDE	7	1	D, EC, or WP	3		
	Toxaphene	7	3	D, EC, or WP	5		
	Toxaphene + DDT	7	5	D or EC	3 + 1		
Tomato psyllid (Paratrioza cockerelli)	DDT	7	5	5% D 50% WP	1 - 1.7 1	On foliage when plants are 6 in. high if psyllid is present in area; repeat in 10 and 20 days.	

*Not effective against pinworm.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
TOMATO, OUTDOOR							
Tomato russet mite (Aculus lycopersici)	Parathion	1	10	D, EC, or WP	0.5	On foliage when fruit begins to set; repeat in 2 - 4 weeks.	Do not use parathion in home garden; should be applied only by a trained operator.
	Sulfur	Safe	1	20 - 50% D WP	6 - 15 10		
	Toxaphene	7	3	D, EC, or WP	5		
Whiteflies	Endosulfan	2	1	D or EC	1	On foliage as needed.	
Wireworms In East	Aldrin*	0.1	--	EC, G, or WP	2 - 3	Broadcast on soil before planting and thoroughly work into upper 4 - 6 in. Soil temperature should be at least 50° F. when diazinon or parathion is applied.	Do not repeat soil application of aldrin, chlordane, DDT, or dieldrin for at least 3 years. After applying parathion to soil, keep all persons and animals off treated area for 48 hours.
	Chlordane*	0.3	--	EC, G, or WP	4 - 8		
	Diazinon	0.75	--	EC, G, or WP	2		
	Dieldrin*	0.1	--	EC, G, or WP	2 - 3		
	Parathion	1	--	EC, G, or WP	3		
In West	DDT	7	--	EC, G, or WP	10	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. Apply DDT at least 6 weeks before planting. Soil temperature must be at least 50° F. when diazinon or parathion is applied.	
	Diazinon	0.75	--	G	3 - 4		
	Parathion	1	--	G	4		
	Ethylene dibromide	50 (inorganic bromide)	--	83% soln. (12 lb./gal.)	36	Inject 8 in. into fallow soil every 12 in.	Do not apply ethylene dibromide within 3 weeks before planting.
TOMATO, LARGE GREENHOUSE**							
Aphids and whiteflies	Endosulfan	2	1	EC	1	Apply in air above plants with mist blower.	Do not use aerosols that contain parathion, tepp, or the propellant methyl chloride in greenhouses connected to living quarters; should be applied only by a trained operator.
		2	15 hr.	10% aerosol	1 lb. aerosol/ 50,000 cu. ft.	In closed greenhouse in air above plants. Temperature should be 70°-85° F. and ventilators closed for at least 2 hours.	
	Malathion	8	15 hr.	10% aerosol			
	Parathion	1	10	10% aerosol			
	Tepp	0	3	5% aerosol			

Continued

*Not effective in Southeast.

**Any greenhouse over 20,000 cu. ft. and not attached to living quarters.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
TOMATO, LARGE GREENHOUSE*							
Aphids and whiteflies (con.)	Naled	--	1	EC	5 oz./50,000 cu. ft.	Apply on steam pipes.	Do not use aerosols that contain parathion, tepp, or the propellant methyl chloride in greenhouses connected to living quarters; should be applied only by a trained operator.
Armyworms, cabbage looper (Trichoplusia ni), cutworms, and thrips	DDT	7	5	3% D	0.6	Dust into air above plants.	
	Malathion	8	15 hr.	10% aerosol	1 lb. aerosol/ 50,000 cu. ft.	In closed greenhouse in air above plants. Temperature should be 70°-85° F. and ventilators closed for at least 2 hours.	
	Parathion	1	10	10% aerosol			
Cutworms (soil)	DDT	7	5	3% D	0.6	On soil surface.	
Garden symphylan (Scutigerella immaculata)	Lindane	10	--	Drench: 6 oz. 25% WP/50 gal.	50 gal. drench/ 1,000 sq. ft.	Sprinkle on soil and water in. Put 1 pt. around base of each newly set plant.	Use lindane only in greenhouse.
Mealybugs, spider mites (Tetranychus spp.) and tomato russet mite (Aculus lycopersici)	Naled	--	1	EC	5 oz./50,000 cu. ft.	Apply on steam pipes.	
	Malathion	8	15 hr.	10% aerosol	1 lb. aerosol/ 50,000 cu. ft.	In closed greenhouse in air above plants. Temperature should be 70°-85° F. and ventilators closed for at least 2 hours.	
	Parathion	1	10	10% aerosol			
	Tepp	0	3	5% aerosol			
Leaf miners (Liriomyza spp.)	Parathion	1	10	10% aerosol	1 lb. aerosol/ 50,000 cu. ft.		
Tomato fruitworm (Heliothis zea) and tomato pinworm (Keiferia lycopersicella)	DDT	7	5	3% D	0.6		
	Parathion	1	10	10% aerosol	1 lb. aerosol/ 50,000 cu. ft.		
TOMATO, SMALL GREENHOUSE**							
Aphids	Malathion	8	1	57% EC	2 tsp. EC/gal.	On foliage as needed.	

*Any greenhouse over 20,000 cu. ft. and not attached to living quarters.
**Any greenhouse less than 20,000 cu. ft. or that is attached to living quarters.

VEGETABLE INSECTS

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
TOMATO, SMALL GREENHOUSE*							
Corn earworm (Heliothis zea)	DDT	7	5	3% D	0.5 lb. D/1,000 sq. ft.	Dust into air above plants.	
	Malathion	8	1	57% EC	2 tsp. EC/gal.	On foliage as needed.	
Cutworms	DDT	7	5	3% D	0.5 lb. D/1,000 sq. ft.	On soil surface.	
Garden symphylan (Scutigerella immaculata)	Lindane	10	--	Drench: 6 oz. 25% WP/50 gal.	50 gal./1,000 sq. ft.	Sprinkle on soil and water in. Put 1 pt. around base of each newly set plant.	Use lindane only in greenhouse.
Greenhouse leaf tier (Udea rubigalis)	DDT	7	5	3% D	0.5 lb. D/1,000 sq. ft.	Dust into air above plants.	
Greenhouse whitefly (Trialeurodes vaporariorum)	Malathion	8	1	57% EC	2 tsp. EC/gal.	On foliage as needed.	
	Rotenone	Exempt	1	4% powder	4 tbsp. powder/gal.		
Mealybugs	Malathion	8	1	57% EC	2 tsp. EC/gal.		
Spider mites (Tetranychus spp.) and tomato russet mite (Aculus lycopersici)	Malathion	8	1	57% EC	2 tsp. EC/gal.		
Thrips and garden fleahopper (Halticus bracteatus)	DDT	7	5	3% D	0.5 lb. D/1,000 sq. ft.	Dust into air above plants.	
	Malathion	8	1	57% EC	2 tsp. EC/gal.	On foliage as needed.	
	Rotenone	Exempt	1	4% powder	4 tbsp. powder/gal.		

*Any greenhouse less than 20,000 cu. ft. or that is attached to living quarters.

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CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
TURNIP							
Aphids	Diazinon	0.75	10	D EC or WP	0.4 - 1 0.4 - 0.5	On foliage when aphids appear; repeat weekly as needed.	Do not use mevinphos or parathion in home garden; should be applied only by a trained operator. Parathion is not effective at low temperatures. If maximum daily temperatures below 70° F. persist after application, do not harvest for 21** days after treatment.
	Malathion	8	10*	D, EC, or WP	1.2		
	Mevinphos	1 tops 0.25 roots	3	D, EC, or WP	0.3 - 0.5		
	Naled	--	4	D or EC	1.5		
	Parathion	1	15**	D, EC, or WP	0.5		
Cabbage looper (Trichoplusia ni) and cabbage webworm (Hellula rogatalis)	Malathion (home garden only)	8	10*	D, EC, or WP	1.2	On foliage every 7 days. On summer or fall plantings in South begin when plants appear; on other plantings when insects appear.	
	Mevinphos	1 tops 0.25 roots	3	D, EC, or WP	0.5		
	Naled	--	4	D or EC	1 - 2		
	Parathion	1	15**	D, EC, or WP	0.5		
Cutworms (soil)	DDT	7	--	D, EC, or WP	2	To soil surface.	Do not use DDT treated tops for food or feed. Do not feed crop residue from fields treated with DDT or toxaphene to dairy animals. Do not use toxaphene after seedling stage if tops are to be used for food or feed.
	Toxaphene	--	--	3% B	0.9	Spread on soil (not plants) in late afternoon.	
Flea beetles	DDT	7	--	D, EC, or WP	1 - 1.5	On foliage as needed.	
	Methoxychlor	14	14***	D or WP	1.7		
	Naled	--	4	EC	1.5		
	Rotenone	Exempt	1	D or S	0.3		
Root maggots	Diazinon	0.75	10	G	1	In seed furrow at planting.	
				EC or WP	0.5	Spray around stems of plants.	
Vegetable weevils (Listroderes spp.)	DDT	7	--	D, EC, or WP	1.5	On foliage as needed.	
	Parathion	1	15**	D, EC, or WP	0.5		
	Rotenone (home garden only)	Exempt	1	D, EC, or powder	0.3		

*3 days if tops are not to be used for food or feed.
**10 days if tops are not to be used for food or feed.
***1 day if tops are not to be used for food or feed.

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
TURNIP							
White-fringed beetles (Graphognathus spp.) Grubs	Aldrin	0.25	--	EC, G, or WP	2	Broadcast on soil before planting and thoroughly work into upper 3 in.	Do not use parathion in home garden; should be applied only by a trained operator. Do not repeat soil application of aldrin, chlordane, or DDT for at least 3 years. Do not feed crop residues from fields treated with aldrin, chlordane, or DDT to dairy animals. After applying parathion to soil, keep all persons and animals off treated area for 48 hours.
	DDT	7	--	EC, G, or WP	10		
Wireworms							
In Northeast	Aldrin	0.25	--	EC, G, or WP	2 - 3	Broadcast on soil surface before planting and thoroughly work into upper 4 - 6 in.	
	Chlordane	0.3	--	EC, G, or WP	4 - 8		
In Southeast	Parathion	1	--	G	3		
In West	DDT	7	--	EC, G, or WP	10	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. Apply DDT at least 6 weeks before planting. Soil temperature must be at least 50° F. when parathion is applied.	
	Parathion	1	--	G	4		
WATERMELON							
Aphids	Demeton	--	7	EC	6 oz.	On foliage as needed.	Do not use demeton, mevinphos, or parathion in home garden; should be applied only by a trained operator. Do not apply parathion before vining.
	Diazinon	0.75	3	D EC or WP	1 0.5		
	Endosulfan	2	1	D EC or WP	1 0.5		
	Malathion	8	1	D or EC	1.2		
	Mevinphos	0.5	1	D or EC	0.5		
	Naled	--	7	D or EC	1.5		
	Parathion	1	7	D or EC	0.3 - 0.5		
Cucumber beetles (Diabrotica spp.)	Malathion	8	1	D or EC	1.2		
	Methoxychlor	14	7	D or WP	1.7		
	Parathion	1	7	D or EC	0.3 - 0.5		

CROP AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m.*)	MIN. DAYS FROM LAST APPLICATION TO HARVEST OR FEEDING	FORMULATION	POUNDS OF ACTIVE INGREDIENT TO APPLY PER ACRE UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
WATERMELON							
Cutworms	Parathion	1	7	D or EC	0.3 - 0.5	Spread on soil (not plants) in late afternoon.	Do not use carbophenothion or parathion in home garden; should be applied only by a trained operator. Do not use toxaphene after edible parts start to form. Do not apply parathion before vining. Do not repeat soil application of chlordane or DDT for at least 3 years. After applying parathion to soil, keep all persons and animals off treated area for 48 hours. Do not apply ethylene dibromide within 3 weeks before planting.
	Toxaphene	--	--	3% B	0.9		
Leafhoppers and thrips	Malathion	8	1	D or EC	1	On foliage as needed.	
	Parathion	1	7	D or EC	0.3 - 0.5		
Leaf miners (Liriomyza spp.)	Diazinon	0.75	3	D EC or WP	0.5 - 0.75 0.3 - 0.5		
	Naled	--	7	D or EC	1.5		
	Parathion	1	7	D or EC	0.3 - 0.5		
Spider mites (Tetranychus spp.)	Carbophenothion	0.8	5	D EC or WP	1.2 1		
	Dicofol	5	2	EC D	0.6 1		
	Parathion	1	7	D or EC	0.3 - 0.5		
Wireworms	Chlordane* (in East)	0.3	--	EC or WP	4 - 8	Broadcast on soil before planting and thoroughly work into upper 6 - 9 in. Apply DDT at least 6 weeks before planting. Soil temperature must be at least 50° F. when diazinon or parathion is applied.	
	DDT (in West)	7	--	EC or WP	10		
	Diazinon	0.75	--	G	3 - 4		
	Parathion	1	--	G	4		
	Ethylene dibromide (in West)	75 (inorganic bromide)	--	83% soln. (12 lb./gal.)	36	Inject 8 in. deep into fallow soil every 12 in.	

*Not effective in Southeast.

LIVESTOCK INSECTS

Precautions. In applying insecticides to livestock or around barns, do not contaminate feed or feed and water troughs, or allow runoff into streams. Observe all other precautions specified in this handbook.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m. in fat unless otherwise indicated)*	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CATTLE, DAIRY							
Cattle grubs (Hypoderma spp.)	Rotenone	--	--	5% WP (7½ lb. per 100 gal. water)	2 - 4 qt.	On back of animal with power sprayer 1 - 3 times every 30 days.	See page 168.
				5% WP (12 oz. per gal. water)	1 pt.	Sponge or brush on back.	
				1.5% D	4 - 5 oz.	Rub thoroughly on back.	
Face fly (Musca autumnalis)	Dichlorvos	--	--	0.5% B	3 - 5 ml.	Brush on forehead in morning; daily or as needed.	
				EC or oil 1% S	1 - 2 fl. oz.	As mist spray daily with hand or automatic sprayer; do not soak skin.	
	Pyrethrins + Synergist*	--	--	Oil soln. or EC 0.05 - 0.1% + 0.5 - 1% S	1 - 2 fl. oz.	As mist spray daily to head and neck, with hand or automatic sprayer.	
	Ciodrin	--	--	EC or oil 2% S	1 - 2 fl. oz.	As mist spray daily to all parts of body, including legs.	
				EC, 0.5 - 1% S EC, 0.15 - 0.3% S	1 - 2 pt. 1 - 4 qt.	Spray thoroughly. Repeat once a week or as necessary.	
				EC, 0.5% S	1 - 2 qt.	Pen or corral spraying with high pressure equipment.	
Horn fly (Haematobia irritans)	Malathion	4 meat 0 milk	--	4% D 5% D	2 oz. 1.5 oz.	Sprinkle on back, neck, and flanks every 10 to 14 days, if needed.	

Continued

*Piperonyl butoxide or sulfoxide. Such supplemental synergists as MGK 264, n-propyl isome, or sesame oil may be used as a partial replacement for piperonyl butoxide. Additives such as MGK R-11, MGK R-326, Crag, and Tabatrex may also be included and used according to manufacturer's directions.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m. in fat unless otherwise indicated)*	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CATTLE, DAIRY							
Horn fly (Haematobia irritans) (con.)	Dichlorvos	--	--	1% oil S	1 - 2 fl. oz.	As mist spray daily to back, flanks, and legs.	See page 168.
	Methoxychlor	3 0 milk	--	50% WP	1 tbsp.	Sprinkle on back, neck, and flanks every 3 weeks.	
	Ciodrin	--	--	3% D	1 - 2 heaping tbsp.	On poll, back, and upper portions of sides every 14 days, if needed.	
				EC, 1%	1 qt.	Pour along backline.	
				EC or oil, 2% S	1 - 2 fl. oz.	As mist spray daily to all parts of body, including legs.	
				EC, 0.5 - 1% S EC, 0.15 - 0.3% S	1 - 2 pt. 1 - 4 qt.	Spray thoroughly. Repeat once a week or as necessary.	
				EC, 0.5% S	1 - 2 qt.	Pen or corral spraying with high pressure equipment.	
				1% oil	1 gal./20 ft. cable	Saturate back rubbers.	
	Pyrethrins + Synergist*	--	--	EC, 0.05% + 0.5% S	1 - 2 qt.	As wet spray every 3 - 7 days.	
				Oil soln. or EC 0.05 - 0.1% + 0.5 - 1% S	1 - 2 fl. oz.	As mist spray daily with hand or automatic sprayer.	
	Lethane 384**	--	--	Oil soln., 3% S	1 - 2 fl. oz.	As mist spray.	

Continued

* Piperonyl butoxide or sulfoxide. Such supplemental synergists as MGK 264, n-propyl isome, or sesame oil may be used as a partial replacement for piperonyl butoxide. Additives such as MGK R-11, MGK R-326, Crag, and Tabatrex may also be included and used according to manufacturer's directions.

**Used in conjunction with other materials.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m. in fat unless otherwise indicated)*	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CATTLE, DAIRY							
Horn fly (Haematobia irritans) (con.)	Thanite*	--	--	Oil soln., 5% S	1 - 2 fl. oz.	As mist spray.	See page 168.
Horse flies, stable fly (Stomoxys calcitrans), and mosquitoes	Dichlorvos**	--	--	1% oil S	1 - 2 fl. oz.	As mist spray, once or twice daily.	
	Ciodrin**	Same as for Face fly.					
	Pyrethrins + Synergist***	--	--	EC, 0.05% - 0.1% + 0.5 - 1% S	1 - 2 qt.	As wet spray every 2 - 3 days.	
				Oil soln., or EC, 0.05 - 0.1% + 0.5 - 1% S	1 - 2 fl. oz.	As mist spray daily, with hand or automatic sprayer.	
	Lethane 384*, **	--	--	Oil soln., 3% S	1 - 2 fl. oz.	As mist spray.	
	Thanite*, **	--	--	Oil soln., 5% S	1 - 2 fl. oz.		
Lice	Ciodrin	--	--	EC, 0.15 - 0.3% S	1 - 4 qt.	Spray thoroughly; repeat after 1 week, if needed.	
				EC, 0.5% S	1 - 2 qt.	Pen or corral spraying with high pressure equipment.	
				EC, 0.1 - 0.25% S	1-2 gal. (1 gal. 0.25%	Apply second application 14 days later.	
	Pyrethrins + Synergist***	--	--	EC, 0.025% + 0.25% S	Depending on size of animals and amount of hair.	Spray or dust thoroughly; repeat after 2 - 3 weeks.	
	Rotenone	--	--	5% WP (1-2 lb. per 100 gal. water)			
				0.5 - 1% D			

*Used in conjunction with other materials.

**Not registered for control of horse flies.

***Piperonyl butoxide or sulfoxide. Such supplemental synergists as MGK 264, n-propyl isome, or sesame oil may be used as a partial replacement for piperonyl butoxide. Additives such as MGK R-11, MGK R-326, Crag, and Tabatrex may also be included and used according to manufacturer's directions.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m. in fat unless otherwise indicated*)	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CATTLE, DAIRY							
Screw-worm (Cochliomyia hominivorax)	Diphenylamine	0 meat 0 milk	--	35% (smear 62)	--	Brush or smear on wound and surrounding area, twice first week and then weekly until healed.	See below.
	Lindane	7	--	3% (EQ 335)	Minimum needed, not more than 3 tsp.		
Spinose ear tick (Otobius megnini)	Lindane	7	--	0.75% in xylene-pine oil	½ oz.	Inside ear with spring-bottom oiler.	
Ticks	Ciodrin	Same as for Lice					
	Pyrethrins + Synergist*	--	--	EC, 0.1% + 1% S	Depending on size of animals and amount of hair.	Spray animals thoroughly as needed.	
	Rotenone	--	--	5% WP (2-4 oz. per gal. water)			

*Piperonyl butoxide or sulfoxide.

SAFETY RESTRICTIONS

Do not apply more than 2 fluid ounces per day per animal when using mist sprays containing Ciodrin, dichlorvos, Lethane 384, or Thanite. Do not wet the hide with the spray.

Do not apply Ciodrin to cattle more often than once a week except as a mist spray. Do not apply Ciodrin dust more often than every 14 days.

Do not use methoxychlor or malathion in sprays or dips on dairy cattle.

Do not apply malathion dust on dairy cattle during or less than 5 hours before milking.

Certain of the insecticides suggested for Beef Cattle on pages 169 - 174 may also be used with limitations on dry dairy animals. See Safety Restrictions under Beef Cattle, page 174 . All insecticides suggested for Dairy Cattle may also be used on beef animals.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m. in fat unless otherwise indicated)*	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CATTLE, BEEF							
Cattle grubs (Hypoderma spp.)	Ronnel* (Purified grade only)	0 meat 0 milk	60	0.6% in feed	0.3 lb./100 lb. body weight	Daily for 7 days.**	See page 174.
			28	0.26% in feed	0.3 lb./100 lb. body weight	Daily for 14 days.**	
			21	5.5% in block or granules	0.25 lb./100 lb. body weight/month	Continuously for not less than 75 days.	
	Coumaphos	1 meat and fat 0 milk	--	WP, 0.375 - 0.5% S or 0.25% dip EC, 0.375% S	Depending on size of animals and amount of hair	Wet entire body to skin.** Higher concentration needed in northern areas or for late fall application when long hair coats make thorough wetting of the skin difficult.	
				WP, 0.25% S	Depending on size of animals and amount of hair.	Make 2 applications not more than 90 days apart. Apply second spray soon after heel fly activity has stopped.	
				Soln, 4%	½ fl. oz./100 lb. body weight; maximum 4 fl. oz. per animal	Pour on evenly along animal's backline.**	
	Ruelene	--	28	EC, 0.5% S	Depending on size of animals and amount of hair	Wet entire body to skin.**	
			28	EC, 8.3% in water Soln., 9.4%	1 oz./100 lb. body weight up to 800 lb. animal, but no more than 8 oz./animal	Pour on evenly along animal's backline.**	

Continued

* Aids in control of lice.

**Use at end of adult heel fly season, but not later than November 1.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m. in fat unless otherwise indicated*)	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CATTLE, BEEF							
Cattle grubs (Hypoderma spp.) (con.)	Trichlorfon	--	14	Soluble powder 1% S	Depending on size of animal and amount of hair	Wet entire body to skin.*	See page 174.
			21	Soln., 8%	½ fl. oz./100 lb. body weight; no more than 4 fl. oz. per animal	Pour on evenly along animal's backline.*	
Face fly (Musca autumnalis)	Coumaphos	1 meat and fat 0 milk	--	1% oil	1 gal./20 ft. cable	Saturate back rubbers; construct back rubbers to permit animal to rub its face.	
Horn fly** (Haematobia irritans)	Carbaryl	--	7	WP, 0.5% S	1 qt.	Spray thoroughly. Repeat as needed.	
				5% D	2 oz.	Dust back and neck only.	
	Dioxathion	1 0 milk	--	1.5% oil	1 gal./20 ft. cable	Saturate back rubbers.***	
				EC, 0.6% in water	1 qt.	Pour on evenly along animal's backline.	
				EC, 0.15% S	1 - 2 qt.	To backs every 3 weeks or as needed.	
	Methoxychlor	3	--	EC or WP, 0.5% S	2 qt.		
				5% oil	1 gal./20 ft. cable	Saturate back rubbers.***	
	DDT	7	30	5% oil			
Continued	Toxaphene	7	28	5% oil			

*Use at end of adult heel fly season, but not later than November 1.

**Dips used to control lice will also control horn flies.

***Use of back rubbers will aid in louse control.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m. in fat unless otherwise indicated)*	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CATTLE, BEEF							
Horn fly* (Haematobia irritans) (con.)	Toxaphene	7	28	EC or WP, 0.5% S	2 qt.	To backs every 3 weeks as needed.	See page 174.
				5% D	1 tbsp.		
	Ronnel	0 meat 0 milk	56	EC or WP, 0.25% S or dip	1 - 2 qt.		
			42	1% oil	1 gal./20 ft. cable	Saturate back rubbers.**	
	Coumaphos	1 meat and fat 0 milk	--	EC or WP, 0.06% S or dip	1 - 2 qt.	To backs every 3 weeks or as needed.	
				1% oil	1 gal./20 ft. cable	Saturate back rubbers.**	
	Malathion	4 meat 0 milk	--	EC or WP, 0.5% S	2 qt.	To backs every 3 weeks or as needed.	
				2% oil	1 gal./20 ft. cable	Saturate back rubbers.**	
	Ruelene	--	28	EC, 0.5% S	Depending on size of animals and amount of hair.	Spray thoroughly.	
				EC, 8.3% in water Soln., 9.4%	1 oz./100 lb. body weight up to 800 lb. animal, but no more than 8 oz./animal	Pour on evenly along animal's backline.	
Lice	Coumaphos	1 meat and fat 0 milk	--	EC or WP, 0.06% S or dip	Depending on size of animals and amount of hair	Immerse or spray thoroughly. Repeat all treatments after 2 - 3 weeks if needed.	
	Dioxathion	1 0 milk	--	EC, 0.15% dip or S			

Continued

*Dips used to control lice will also control horn flies.
**Use of back rubbers will aid in louse control.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m. in fat unless otherwise indicated)*	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CATTLE, BEEF							
Lice* (con.)	Lindane	7	30	EC or WP, 0.03 - 0.05% S	Depending on size of animals and amount of hair	Immerse, spray, or dust thoroughly. Repeat all treatments after 2 - 3 weeks, if needed.	See page 174.
			60	EC or WP, 0.03% dip			
			30	1% D			
	Malathion	4 meat 0 milk	--	EC or WP, 0.5% S			
				4 - 5% D			
	Methoxychlor	3	--	EC or WP, 0.5% S (1 - 1.5% for tail louse)			
				10% D			
	Carbaryl	--	7	WP, 0.5% S	1 qt.	Spray thoroughly. Repeat as needed.	
	Ronnel	0 meat 0 milk	56	EC or WP, 0.125% dip or S	Depending on size of animals and amount of hair	Immerse, spray, or dust thoroughly. Repeat all treatments after 2- 3 weeks if needed.	
	Toxaphene	7	28	EC or WP, 0.5% dip or S			
				5% D			
	Ruelene**	--	28	EC, 0.5% S	Depending on size of animals and amount of hair	Spray thoroughly.	
				EC, 8.3% Soln., 9.4%	Same as for Horn fly.		

*Dips used to control lice will also control horn flies.
**Ruelene pour-on treatment (See Horn Flies) or spray will reduce numbers of lice.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m. in fat unless otherwise indicated)*	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CATTLE, BEEF							
Screw-worm (Cochliomyia hominivorax)	Coumaphos	1 meat and fat 0 milk	--	5% D	--	Dust wounds and surrounding area thoroughly. Repeat as necessary.	See page 174.
				WP, 0.25% S, 0.125% dip EC, 0.25% S	Depending on size of animals and amount of hair	Spray wounds thoroughly and wet entire body; repeat after 2 weeks if needed.	
	Ronnel	0 meat	56	EC or WP, 0.5%S			
			21	5% smear	Minimum needed, not more than 3 tsp.	Brush or smear on wound and surrounding area and into deep pockets twice first week and then weekly until healed.	
			21	5% D	--	Dust wounds and surrounding area thoroughly.	
Ticks	Carbaryl	--	7	WP, 0.5% S	1 qt.	Spray thoroughly. Repeat as needed.	
	Coumaphos	1 meat and fat 0 milk	--	WP, 0.125% S or dip	Depending on size of animals and amount of hair	Immerse or spray thoroughly. Repeat all treatments after 2 - 3 weeks if needed.	
	Dioxathion	1 0 milk	--	EC, 0.15% dip or S			
	Lindane	7	30 (S) 60 (dip)	EC or WP, 0.03% dip or S			
	Malathion	4 meat 0 milk	--	EC or WP, 0.5%S			

Continued

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m. in fat unless otherwise indicated*)	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
CATTLE, BEEF							
Ticks (con.)	Ronnel	0 meat 0 milk	56	EC or WP 0.75% dip or S	Depending on size of animals and amount of hair.	Immerse or spray thoroughly. Repeat all treatments after 2 - 3 weeks if needed.	See below.
	Toxaphene	7	28	EC or WP, 0.5% dip or S			
Spinose ear tick (Otobius megnini)	Coumaphos	1 meat and fat 0 milk	--	5% D	--	Lightly inside ears. Also treat adjacent head area. Repeat as necessary.	
	Malathion	4 meat 0 milk	--	EC or WP, 0.5%S (low pressure)	--		
	Ronnel	0 meat 0 milk	21	5% D	--	Dust into ear as deeply as possible and surrounding areas.	
				5% smear	--	Pour or brush in ears, or apply with a swab.	

SAFETY RESTRICTIONS

Certain of the insecticides mentioned below may also be applied to dry dairy animals, with the limitations indicated.

Do not treat sick animals.

Coumaphos, ronnel, Ruelene, and trichlorfon are systemic insecticides. If you feed ronnel, do not spray, dip, or pour-on ronnel, coumaphos, Ruelene, or trichlorfon. Do not feed ronnel in more than one form. If you are not feeding ronnel and you spray, dip, or pour-on one of these four insecticides, do not treat the same animal with any of the other three.

Do not feed ronnel to sick or stressed animals. Do not feed 0.6% ronnel to lactating dairy animals, or to dry dairy animals within 60 days of freshening; or 0.26% in feed within 28 days or 5.5% in block or granules within 21 days of freshening. Do not use spray, back rubbers, or dust on lactating dairy animals or dry dairy animals within 21 days of freshening. Do not reapply sprays within 2 weeks.

Do not reapply dioxathion sprays within 2 weeks or pour-on within 30 days. Do not dip calves less than 3 months old. Do not treat dairy animals.

Do not use trichlorfon on dairy animals. Do not treat animals less than 3 months old, sick, convalescent, or stressed animals. Do not treat 10 days before or after shipping, weaning or after exposure to contagious diseases. Do not apply in conjunction with oral drenches, other internal medications, or other organic phosphates.

Do not treat animals less than 3 months old with coumaphos. Spray animals 3 - 6 months old lightly. Do not use with synergized pyrethrins, allethrin, or synergist. Do not spray animals or apply pour-on for 10 days before or after shipping or weaning, or after exposure to disease. Do not apply in conjunction with oral drenches or other medications, such as phenothiazine, or with other organic phosphates. Do not apply to lactating dairy animals or to dry dairy animals within 14 days of freshening. Do not use back rubbers for dairy animals. Do not dip overheated animals.

Do not treat calves with dips or sprays containing more than 0.03% lindane. Do not dip calves less than 3 months old in lindane. Do not use on emanciated or lactating animals.

Do not apply Ruelene to lactating dairy animals or to dry dairy animals within 28 days of freshening. Do not use Ruelene pour-on in extremely hot or humid weather; dermatitis may result. Do not apply more often than every 28 days.

Do not use malathion on calves less than 1 month old. Do not treat lactating dairy animals or dry dairy animals within 14 days of freshening. Do not use back rubbers on dairy animals.

Do not apply carbaryl more often than once every 4 days. Do not use on dairy animals.

Do not treat dairy animals with DDT or toxaphene.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m. in fat unless otherwise indicated)*	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
HORSES							
Bots (Gasterophilus spp.)	Trichlorfon	--	--	Tech., 90%	1 packet (5 grams) per 250 lb. body weight	Single dose orally in feed, one month after killing frost.	See below

SAFETY RESTRICTIONS

Do not treat sick or debilitated horses, colts less than 4 months old, or mares in the last month of pregnancy. Do not administer trichlorfon in conjunction with (or 10 days after treatment with) other organic phosphates or cholinesterase inhibitors. Do not repeat more often than once every 30 days. Do not administer intravenous anesthetics, especially muscle relaxants, for a period of 2 weeks after using trichlorfon. Do not treat horses to be used for food.

SHEEP AND GOATS							
Fleeceworms	Coumaphos	1 meat and fat 0 milk	15	0.5% D	1 - 2 oz.	Rub into wool over entire body.	See page 179.
				WP, 0.125% S or dip	Depending on size of animals and amount of hair	Immerse or spray thoroughly.	
	Dioxathion	1	--	EC, 0.15% dip or S			
	Lindane	7	--	3% (EQ 335), 1 part to 9 parts water	--	Wet infested area and 3 in. around it.	
	Ronnel	--	21	5% smear, 1 part to 9 parts water	--		
			84	EC or WP, 0.5% dip or S	Depending on size of animals and amount of hair	Immerse or spray thoroughly.	
Lice	Ciodrin	--	--	EC, 0.5 - 1% S	1 - 2 pt.	Spray thoroughly. Repeat once a week or as necessary.	
				EC, 0.15 - 0.3% S	1 - 4 qt.		

Continued

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m. in fat unless otherwise indicated)*	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SHEEP AND GOATS							
Lice (con.)	Ciodrin (continued)	--	--	EC, 0.1-0.25% S	1-2 gal. (1 gal. 0.25%)	Repeat application after 14 days.	See page 179.
	Coumaphos	1 meat and fat 0 milk	15	WP, 0.125% S or dip	Depending on size of animals and amount of hair	Immerse, spray, or dust thoroughly. Use DDT only once, but repeat other treatments after 2-3 weeks if needed	
	DDT	7	30	EC or WP, 0.25% dip, 0.5% S			
	Dioxathion	1	--	EC, 0.15% dip or S			
	Lindane	7	30	EC or WP, 0.05% S			
			60	0.025% dip			
			30	1% D			
	Malathion	4 meat 0 milk	--	EC or WP, 0.5% dip or S			
				4-5% D			
	Methoxychlor	3	--	EC or WP, 0.25% dip, 0.5% S			
	Carbaryl*	--	7	WP, 0.5% S	1 qt.	Spray thoroughly. Repeat as needed.	
	Ronnel	--	84	EC or WP, 0.25% dip or S	Depending on size of animals and amount of hair	Immerse, spray, or dust thoroughly. Repeat treatments after 2-3 weeks if needed.	
	Rotenone	--	--	5% WP (1-2 lb. per 100 gal. water)			
				0.5-1.0% D			
	Toxaphene	7	28	EC or WP, 0.25% dip, 0.5% S			

Continued

*Sheep only. Do not use on goats.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m. in fat unless otherwise indicated)*	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SHEEP AND GOATS							
Lice (con.)	Diazinon*	0.75 meat and fat	14	EC or WP, 0.03% S	1 gal.	--	See page 179.
				0.06% S (low pressure)	1 qt.	--	
Screw-worm (Cochliomyia hominivorax)	Diphenylamine	0 meat 0 milk	--	35% (smear 62)	Minimum necessary to treat wound	Brush or smear on and around wound, twice first week and weekly until healed.	
	Lindane	7	--	3% (EQ 335)			
	Ronnel	--	21	5% smear	--	Brush or smear on and around wound.	
		--	84	EC or WP, 0.5% S or dip	Depending on size of animals and amount of hair	Immerse or spray wounds thoroughly. Wet entire body.	
	Coumaphos	1 meat and fat 0 milk	15	WP, 0.25% S			
			--	5% D	--	Dust wounds and surrounding area thoroughly. Repeat as necessary.	
Sheep ked (Sheep tick Melophagus ovinus)	Dieldrin*	0 meat	90	1.5% D	1.5 - 3 oz.	Dust only once, after shearing.	
	Coumaphos	1 meat and fat 0 milk	15	0.5% D	1 - 2 oz.	Rub into wool over entire body.	
				WP, 0.125% S or dip	Depending on size of animals and amount of hair	Immerse, spray, thoroughly. Use DDT only once, but repeat other treatments after 2 - 3 weeks if needed.	
	DDT	7	30	EC or WP, 0.25% dip, 0.5% S			
	Dioxathion	1	--	EC, 0.15% dip or S			
	Lindane	7	30 (S) 60 (dip)	EC or WP, 0.025% dip, 0.05% S			

Continued

*Sheep only. Do not use on goats.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m. in fat unless otherwise indicated*)	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SHEEP AND GOATS							
Sheep ked (Sheep tick Melophagus ovinus) (con.)	Malathion	4 meat 0 milk	--	EC or WP, 0.5% dip or S 4 - 5% D	Depending on size of animals and amount of hair	Immerse, spray, or dust thoroughly. Repeat treatments after 2 - 3 weeks if needed.	See page 179.
	Pyrethrins + Synergist*	--	--	0.1% + 1.0% S			
	Ronnel	--	84	EC or WP, 0.25 - 0.5% dip or S			
	Rotenone	--	--	5% WP (8 oz. per 100 gal. water)			
	Toxaphene	7	28	EC or WP, 0.25% dip, 0.5% S			
	Diazinon**	0.75 meat and fat	14	EC or WP, 0.03%S	1 gal.	--	
				0.06% S (low pressure)	1 qt.	--	
				2% D	1.5 oz.	Immediately after shearing	
Ticks	Coumaphos	1 meat and fat 0 milk	15	WP, 0.125% S or dip	Depending on size of animals and amount of hair	Immerse or spray thoroughly. Repeat after 2 - 3 weeks, if needed.	
	Dioxathion	1	--	EC, 0.15% dip or S			
	Lindane	7	30(S) 60 (dip)	EC or WP, 0.025 - 0.03% dip or S			
	Ciodrin	Same as for lice.					
	Malathion	4 meat 0 milk	--	EC or WP, 0.5% dip or S 4 - 5% D	Depending on size of animals and amount of hair	Immerse, dust, or spray thoroughly. Repeat after 2 - 3 weeks, if needed.	
	Ronnel	--	84	EC or WP, 0.25 - 0.5% dip or S			

Continued

*Piperonyl butoxide or sulfoxide.

**Sheep only. Do not use on goats.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m. in fat unless otherwise indicated)*	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SHEEP AND GOATS							
Ticks (con.)	Toxaphene	7	28	EC or WP, 0.25% dip, 0.5% S	Depending on size of animals and amount of hair	Immerse or spray thoroughly. Repeat after 2 - 3 weeks, if needed.	See below.
	Carbaryl*	--	7	WP, 0.5% S	1 qt.	Spray thoroughly. Repeat as needed.	
	Diazinon*	0.75 meat and fat	14	EC or WP, 0.03%S	1 gal.	--	
				0.06% S (low pressure)	1 qt.	--	

*Sheep only. Do not use on goats.

SAFETY RESTRICTIONS

Do not treat sick animals.

Do not treat animals less than 3 months old with coumaphos. Spray animals 3-6 months old lightly. Do not use with synergized pyrethrins, allethrin, or synergist. Do not spray animals for 10 days before or after shipping or weaning, or after exposure to disease. Do not apply in conjunction with oral drenches or other medication, such as phenothiazine, or with other organic phosphates. Do not apply coumaphos on lactating dairy goats or to dry dairy goats within 14 days of freshening.

Do not dip animals less than 3 months old in dioxathion. Do not reapply spray or dip within 2 weeks. Do not use dioxathion on milk goats.

Do not apply Ciodrin more often than once a week.

Do not use lindane on emaciated or lactating animals, except in a smear for screw-worm control. Do not use lindane, DDT, or toxaphene on milk goats. Do not dip animals less than 3 months old in lindane.

Do not reapply ronnel within 2 weeks. Do not apply on lactating dairy goats or dry goats within 21 days of freshening.

Do not use methoxychlor on lactating goats.

Do not use malathion on animals less than 1 month old. Do not apply to dairy goats.

Do not apply carbaryl more often than once every 4 days. Do not use on goats.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m. in fat unless otherwise indicated*)	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
SWINE							
Lice	Carbaryl	--	7	WP, 0.5% S	1 qt.	Spray thoroughly. Repeat as needed.	Do not treat sick animals.
	Ciodrin	--	--	EC, 0.5 - 1% S	1 - 2 pt.	Spray thoroughly. Repeat once a week or as necessary.	Do not apply carbaryl more often than once every 4 days.
				EC, 0.15 - 0.3% S	1 - 4 qt.		
				EC, 0.1 - 0.25% S	1 - 2 gal. (1 gal. 0.25%)	Repeat application after 14 days.	Do not apply Ciodrin more often than once a week.
	Coumaphos	1 meat and fat 0 milk	--	WP, 0.125% S	Depending on size of animals and amount of hair	Immerse, spray, or dust thoroughly. Use lindane dusts and DDT dusts and sprays only once, but repeat other treatments after 2 - 3 weeks if needed.	Do not treat animals less than 3 months old with coumaphos. Spray animals 3 - 6 months old only lightly. Do not use with synergized pyrethrins, allethrin, or synergist. Do not spray animals for 10 days before or after shipping or weaning or after exposure to disease. Do not apply in conjunction with oral drenches or other medications, such as phenothiazine or with other organic phosphates.
	DDT	7	30	EC or WP, 0.5% dip or S			
				10% D			
	Dioxathion	1	--	EC, 0.15% dip or S			
	Lindane	4	30(S) 60 (dip)	EC or WP, 0.05 - 0.06% dip or S			
			30 (D)	1% D			
	Malathion	4 meat	--	EC or WP, 0.5% dip or S			
				4 - 5% D			
	Methoxychlor	3	--	EC or WP, 0.5% dip or S			Do not reapply dioxathion or ronnel within 2 weeks. Withdraw bedding treated with ronnel 14 days before slaughter of swine.
	Ronnel	--	42	EC or WP, 0.25 - 0.5% S			
			14	5% G	0.5 lb./100 sq. ft. bedding	--	Do not dip animals less than 3 months old in lindane or dioxathion.
	Toxaphene	7	28	EC or WP, 0.5% S	Depending on size of animals and amount of hair	Spray thoroughly. Repeat after 2 - 3 weeks, if needed.	Do not use malathion on animals less than one month old.

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE (*p. p. m. in fat unless otherwise indicated*)	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
POULTRY							
Lice or mites	Coumaphos	1 meat and fat 0 eggs	--	WP, 0.25% S	1 gal./1,000 sq. ft. of surface	Thorough coverage.	Do not contaminate feed or water, or water utensils or feed troughs. Do not spray in a confined, non-ventilated area. Do not use coumaphos more often than once a week. Do not use coumaphos dust or spray on birds within 10 days of vaccination or other stress influence or in conjunction with other organic phosphates. Provide thorough ventilation while dusting.
				5% D	2 oz./100 sq. ft. of surface or 2 oz. per 30 sq. ft. of litter		
				0.5% D	1 lb./20 sq. ft. of litter		
				WP, 0.25% S 0.5% D	1 gal./100 birds 1 lb./100 birds	Direct on birds.	
	Malathion	4 meat 0 eggs	--	3% roost paint	1 pt./150 ft.	Paint roosts thoroughly.	
				EC or WP, 1% S 4 - 5% D	1 - 2 gal./1,000 sq. ft. 1 lb./40 sq. ft. of litter	Thorough coverage. Force into cracks.	
				4% D EC or WP, 0.5% S or dip	1 lb./100 birds 1 gal./100 birds (1 gal./400 birds in dip)	Direct on birds.	
	Naled	--	--	EC, 0.3% S	1 gal./100 birds	Apply as a light mist to birds, except heads.	Do not apply naled direct on chickens under 6 weeks old or on turkeys under 3 months old.
				EC, 0.3% S	2 gal./1,000 sq. ft.	Thorough coverage.	
	Carbaryl	5 meat and fat 0 eggs	7	5% D	1 lb./100 birds	Dust birds thoroughly. Repeat in 4 weeks if needed, but not more often.	

Continued

ANIMAL AND INSECT	INSECTICIDE	TOLERANCE *(p. p. m. in fat unless otherwise indicated)*	MIN. DAYS FROM LAST APPLICATION TO SLAUGHTER	FORMULATION AND STRENGTH	AMOUNT OF FORMULATION PER ANIMAL UNLESS OTHERWISE INDICATED	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
POULTRY							
Lice or mites (con.)	Carbaryl (con.)	5 meat and fat 0 eggs	7	5% D	1 lb./40 sq. ft. of litter and roosts	Thorough coverage. Force into cracks.	Do not contaminate feed or water, or water utensils or feed troughs.
				WP, 0.5% S	1-2 gal./1,000 sq. ft.		
				4% water mist	1.5 gal./1,000 birds with electric fog machine	Direct on birds, roosts, and walls.	Do not spray in a confined, non-ventilated area.
				0.5% water mist spray	1 gal./100 birds with cylinder sprayer		Do not apply carbaryl spray on birds except in a water mist spray. Do not treat nest litter. Ventilate while spraying.
	Nicotine sulfate	--	--	40% nicotine soln.	1 pt./150-200 ft.	Paint on roosts only.	
Lice only	Rotenone	--	--	1% D	1 lb./100 birds	Direct on birds, roosts, and nests.	
Depluming mite only (Knemidokoptes gallinae)	Sulfur	--	--	100% D 1-2 oz. WP/gal. water dip	--	Dust or immerse thoroughly.	
Fowl tick (Argas persicus)	Chlordane	--	--	EC or WP, 2% S	1 gal./1,000 sq. ft.	For outside use only where ticks are numerous, such as trees, old roosts, or buildings.	Do not use chlordane, DDT, or toxaphene on birds or inside poultry buildings.
	DDT	--	--	EC or WP, 5% S	1-2 gal./1,000 sq. ft.		
	Toxaphene	--	--	EC or WP, 5% S	1-2 gal./1,000 sq. ft.		
	Malathion	4 meat 0 eggs	--	EC or WP, 3% S	1-2 gal./1,000 sq. ft.	Thorough coverage of walls, ceilings, and floors. Force into cracks.	
	Carbaryl	5 meat and fat 0 eggs	7	WP, 2% S	1-2 gal./1,000 sq. ft.		
	Naled	--	--	EC, 0.3% S	2 gal./1,000 sq. ft.		Do not apply naled direct on chickens under 6 weeks old or on turkeys under 3 months old.

INSECTS	INSECTICIDE	FORMULATION AND STRENGTH	DOSAGE *(Formulation per 1,000 sq. ft. for surfaces and per 1,000 cu. ft. for space sprays unless otherwise indicated)*	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
INFESTED AREAS					
House fly (Musca domestica), face fly (M. autumnalis), and stable fly (Stomoxys calcitrans)*					
Inside or outside of barns	Pyrethrins + synergist**	0.1 - 0.25% + 1 - 2% S	--	Space spray	In using any insecticide, do not contaminate animal feed, water, milk, or milking equipment.
	Dichlorvos	EC, 0.5% S	1 qt.	Spray exterior and interior surfaces.	Do not apply dichlorvos in a fog in areas where animals have received direct applications of this insecticide within 8 hours.
		0.5% oil	2 pt./8,000 cu. ft.	Fog	
		1% oil	1 pt./8,000 cu. ft.		Exclude dairy animals while spraying barns (except synergized pyrethrins).
		1% dry B 0.1% liquid B	--	Broadcast or sprinkle daily or as needed where flies congregate	
	Trichlorfon	1 - 2% dry B 0.1% liquid B	--		
	Diazinon	1 - 2% dry B 0.1% liquid B			
		EC or WP, 1% S	1 - 2 gal.	Thorough coverage of resting surfaces.	
	Lindane	EC or WP, 0.3 - 0.5% S	1 gal.		Do not use lindane in poultry houses.
	Methoxychlor	EC or WP, 2.5 - 5% S	1 - 2 gal.		
	Fenthion	0.75 - 1.5% S	2 gal.		Do not apply fenthion in dairy barns, milkrooms, or poultry houses.
	Ronnel	EC or WP, 0.5 - 1% S	1 - 2 gal.		
		WP, 2% S	--	Spray poultry droppings under cages.	
		1% dry B 2% liquid B	--	Broadcast or sprinkle daily or as needed where flies congregate.	

Continued

*Baits ineffective against stable flies. For face flies, spray sunny surfaces of barns, shelters, and fences where flies congregate.
**Piperonyl butoxide or sulfoxide.

INSECTS	INSECTICIDE	FORMULATION AND STRENGTH	DOSAGE *(Formulation per 1,000 sq. ft. for surfaces and per 1,000 cu. ft. for space sprays unless otherwise indicated)*	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
INFESTED AREAS					
House fly, (Musca domestica), face fly (M. autumnalis), and stable fly (Stomoxys calcitrans)*					
Inside or outside of barns (con.)	Ciodrin	EC, 1% S	1 gal.	Thorough coverage of resting surfaces.	In using any insecticide, do not contaminate animal feed, water, milk, or milking equipment.
		EC or soln., 2% S	0.5 gal.		
	Naled	1% in oil	1 fl. oz./3,000 cu. ft.	Space spray or fog.	Exclude dairy animals while spraying barns (except Ciodrin and naled).
	Malathion	0.5% dry B 0.5% liquid B	--	Broadcast or sprinkle daily or as needed where flies congregate.	Do not apply oil solution of naled directly on animals or in poultry houses when birds are present.
		3.5% dry B 1.25% liquid B			
	Dimethoate	EC or WP, 2.5% S	1-2 gal.	Thorough coverage of resting surfaces.	Remove animals from buildings prior to spraying with dimethoate.
		EC, 1% S	1 gal.		
Outside of barns only	Chlordane	EC or WP, 2-2.5% S	1-2 gal. S/1,000 sq. ft.	Thorough coverage of exterior surfaces, vegetation, manure, and refuse. Use DDT also as a space spray.	Do not use on crops or grazing areas.
	DDT	EC or WP, 2-5% S	0.5-1 gal. S/1,000 sq. ft. or cu. ft.		
	Toxaphene	EC or WP, 5% S	0.5-1 gal. S/1,000 sq.ft.		
Chiggers	Chlordane or Toxaphene	EC or WP, 1% S or 5% D	2 lb. insecticide/acre	Spray or dust every 4-8 weeks or as needed.	
	Lindane	EC or WP, 0.1% S or 1% D	0.25-1 lb. insecticide per acre.		
	Malathion	EC, 0.25% S	0.5-1 lb. insecticide per acre	Apply 1 day before turkeys are put on range. Repeat after 2-3 weeks.	Do not contaminate feed, feed troughs, or drinking water.

*Baits ineffective against stable flies. For face flies, spray sunny surfaces of barns, shelters, and fences where flies congregate.

INSECTS	INSECTICIDE	FORMULATION AND STRENGTH	DOSAGE *(Formulation per 1,000 sq. ft. for surfaces and per 1,000 cu. ft. for space sprays unless otherwise indicated)*	WHERE AND WHEN TO APPLY	SAFETY RESTRICTIONS
INFESTED AREAS					
Ticks	Chlordane, dieldrin, or toxaphene	EC or WP, 1% S or 5 or 10% D	1-3 lb. insecticide per acre	Once or twice a year as needed.	Do not use on crops or grazing areas.
	DDT	EC or WP, 1% S or 10% D	1-3 lb. insecticide per acre		
	Lindane	EC or WP, 0.1% S or 1% D	0.2-1 lb. insecticide per acre		
Imported fire ant (Solenopsis saevissima richteri)	Aldrin	EC or WP, 0.25%	--	Drench nest with liquid. Dust nest thoroughly.	
	Chlordane	EC or WP, 0.25% or 5% D			
	Dieldrin	EC or WP, 0.25% or 1.5% D			
	Heptachlor	EC, 0.25% or 2.5% D			
	Mirex	0.075%	10 lb. bait/acre	Broadcast in infested areas.	Do not make more than 3 applications in any 12-month period or more than 1 application in any 45- to 60-day period. (See container label.)
		0.15% B	5 lb. bait/acre		
		0.3% B*	2.5 lb. bait/acre		

*This application in Federal-State cooperative program only.

INSECTICIDE*	CONTROL OF LARVAE OUTDOORS		CONTROL OF ADULTS OUTDOORS		CONTROL OF ADULTS IN DWELLINGS		SAFETY RESTRICTIONS
	LARVICIDE	PREHATCH 1/	SPACE SPRAY OR FOG 2/	RESIDUAL ON VEGETATION 3/	SPACE SPRAY OR AEROSOL 2/	RESIDUAL SPRAY 2/	
	DOSAGE *(active ingredient per acre unless otherwise indicated)*						
Pyrethrins	Oil emulsion, 0.006% at 55 gal./acre Oil emulsion, 0.007% at 15 - 25 gal./acre	--	0.25% + 2% piperonyl butoxide or sulfoxide (about 0.01 lb. pyrethrins/acre)	--	0.25% + 2% piperonyl butoxide or sulfoxide	--	Do not exceed these dosages or fish kill may result.
Malathion	EC or soln., 0.5 lb.	--	0.1 - 0.5 lb.**	--	2 - 5%	3 - 5%	Use with care to avoid hazards to fish and wildlife. Use malathion as a residual spray in dwellings for spot treatments only.
Methoxychlor	--	--	0.2 lb.	--	3%	5%	
Naled	--	--	0.1 - 0.25 lb.	--	1%	--	
Paris green	G, 0.6 - 1.5 lb.	--	--	--	--	--	
Abate	EC, 0.016 - 0.046 lb.	--	--	--	--	--	Do not treat areas where food or feed crops are grown; do not use on range or pasture. Do not contaminate food or feed crops. Use with care where fish and wildlife may be endangered. Use residual sprays in dwellings for spot treatment only (except DDT or ronnel).
Chlordane	EC, WP, or soln., 0.2 - 0.4 lb.	--	0.2 - 0.4 lb.	--	--	2%	
DDT	EC, WP, or soln., 0.05 - 0.4 lb.	EC or WP, 1 - 3 lb.	0.2 lb.	WP, 1 - 3 lb.	3 - 5%	5%	
Dichlorvos***	--	--	0.05 - 0.1 lb.	--	0.5%	0.5%	
Lindane	EC, WP, or soln., 0.1 - 0.15 lb.	--	0.1 - 0.2 lb.	WP, 0.5 - 2 lb.	--	0.5%	
Ronnel	--	--	--	1%	1%	1%	

1/ Apply on nonagricultural lands only. Prehatch may be especially hazardous to fish and wildlife.
2/ EC or oil solution. Pyrethrins, malathion, and naled may be used to control adult mosquitoes on pastures, forage areas, and rangelands.
3/ Apply on nonagricultural vegetation only. May be hazardous to fish and wildlife.
* Other insecticides, such as aldrin, TDE, toxaphene, Thanite, and Lethane 384, have certain uses in mosquito control. If such products are used, follow manufacturer's directions on the label.
** Low-volume malathion spray by aircraft: 0.15 - 0.3 lb./acre; see label for time limitations on various crops.
*** Available also in a resin strip for use indoors and in sewer catch basins.

INSECTICIDE	CONTROL OF LARVAE OUTDOORS		CONTROL OF ADULTS OUTDOORS		CONTROL OF ADULTS IN DWELLINGS		SAFETY RESTRICTIONS
	LARVICIDE	PREHATCH 1/	SPACE SPRAY OR FOG 2/	RESIDUAL ON VEGETATION 3/	SPACE SPRAY OR AEROSOL	RESIDUAL SPRAY 2/	
	DOSAGE *(active ingredient per acre unless otherwise indicated)*						
Dieldrin	EC or soln., 0.05 - 0.1 lb.	EC or G, 1 lb.	--	WP, 0.5 - 1 lb.	--	0.5%	Do not treat areas where food or feed crops are grown; do not use on range or pastures; do not contaminate food or feed crops. Particularly hazardous to wildlife. Dieldrin prehatch treatments will destroy all aquatic animal life; use only in stagnant water, intermittently flooded areas, temporary rain pools, and sloughs and log ponds too small or polluted to support fish life. Heptachlor as a larvicide should be applied only by trained personnel. Do not use in vicinity of commercial shellfish beds. Outdoor treatments with dieldrin and heptachlor should be made only by trained personnel. Use residual sprays in dwellings for spot treatments only.
Heptachlor	EC or soln., 0.1 lb. G, 0.05 - 0.1 lb.	--	0.1 lb.	--	--	0.5%	
EPN	WP, 0.0375 - 0.075 lb.	--	--	--	--	--	Any application of EPN, fenthion, or parathion should be made only by trained personnel. To avoid excessive residues where cattle graze, larvicide only the water areas. Keep cattle off treated vegetation for 4 or more days (parathion -- 1 day) after treatment with larvicide, space spray, or fog. Use all the insecticides with care where fish and wildlife may be endangered. Use fenthion as a residual spray in dwellings for spot treatments only.
Fenthion	EC, WP, or soln., 0.05 lb. or G, 0.05 - 0.1 lb.	--	0.1 lb.	WP, 1 - 3 lb.	--	3%	
Parathion	EC or soln., 0.063 - 0.1 lb.	--	--	--	--	--	

1/ Apply on nonagricultural lands only. Prehatch may be especially hazardous to fish and wildlife.
2/ EC or oil solution.
3/ Apply on nonagricultural vegetation only. May be hazardous to fish and wildlife.

HOUSEHOLD INSECTS

Precautions: In applying any insecticide in the household, observe all precautions specified in this handbook. Use only products specifically labeled for use in homes. Follow the directions and heed the precautions on the container label.

INSECTS	INSECTICIDE	STRENGTH		WHERE AND HOW TO APPLY	REMARKS AND PRECAUTIONS
		SPRAY*	DUST**		
Ants	Chlordane	2 - 3%	5% or 6%	Paint or spray baseboards and cracks. Dust behind baseboards and in out-of-sight areas.	Use on limited areas only. Do not treat entire walls or floor. Do not contaminate food, water, dishes, or utensils with insecticides. Do not allow children or pets near treated surfaces until spray has dried.
	Diazinon	0.5%	--		
	Dichlorvos	0.5%	--		
	Dieldrin	0.5%	1%		
	Heptachlor	0.5%	--		
	Lindane	0.5%	1%		
	Malathion	2 - 3%	4% or 5%		
	Kepone	--	(0.125% B)	Place in nest openings, around foundations and in other areas frequented by ants.	Do not use in places where this bait might be accessible to children or pets.
Bed bugs*** (Cimex spp.)	DDT	5%	--	To slats, springs, and frames of bed. Spray mattress lightly. Paint or spray baseboards and wall cracks.	Allow mattress to dry before use. A higher concentration of lindane (0.5%) may be used on slats, springs, and frames of bed.
	Lindane	0.1%	--		
	Malathion	1%	--		
	Ronnel	1%	--		
	Dichlorvos	0.5%	--	Tufts and seams only, on mattress. Also to slats, springs and frames of bed.	Dry at least 4 hours before use.
Clothes moths and carpet beetles	See page 204 for control measures.				
Cockroaches***	Chlordane	2 - 3%	5% or 6%	Paint or spray baseboards, cabinets, and other hiding places. Dust behind baseboards and in out-of-sight areas. Treat places where pipes go through walls or floors.	Use on limited areas only. Do not treat entire walls or floor. If food and dish shelves are treated, allow to dry, then cover them with shelf paper before replacing articles. Do not contaminate food, water, dishes, or utensils. Do not allow children or pets near treated surfaces until spray has dried.
	Diazinon	0.5%	--		
	Dichlorvos	0.5%	--		
	Dieldrin	0.5%	1%		
	Heptachlor	0.5%	--		
	Lindane	0.5%	1%		
	Malathion	2 - 3%	4% or 5%		
	Ronnel	2%	--		

Continued

* Some formulations may be purchased ready to use; others must be prepared by diluting emulsifiable concentrates or wettable powders.

** May be purchased ready to use.

*** May be resistant to one or more of the following insecticides: chlordane, DDT, dieldrin, or lindane.

INSECTS	INSECTICIDE	STRENGTH		WHERE AND HOW TO APPLY	REMARKS AND PRECAUTIONS
		SPRAY*	DUST**		
Cockroaches (con.)	Kepone	--	(0.125% B)	Place in areas frequented by cockroaches	Do not use in places where this bait might be accessible to children or pets.
Fleas***	DDT	5%	5% or 10%	Apply to floor and baseboards and to walls to a height of 1 foot; dust rugs thoroughly; spray rugs and furniture lightly.	Supplement by treating dogs or cats with a product labeled for such use. Do not apply DDT to cats or puppies.
	Malathion	2%	4% or 5%		
	Methoxychlor	5%	10%		
	Ronnel	1%	--		
Flies	Malathion	2%	4% or 5%	Apply around windows and to other surfaces frequented by flies.	Do not contaminate food, water, dishes, or utensils.
	Naled	1%	--		
	Ronnel	1 - 2%	--		
	Dichlorvos****	0.5%	--	Spray into the air when flies are present. Available in aerosol bombs. Use only sprays or aerosols labeled for flying insects. Apply according to directions on container label.	Some products also contain Lethane 384, Thanite, DDT, methoxychlor, or lindane.
	Malathion	2 - 4%	--		
	Pyrethrins + Piperonyl butoxide	0.1 - 0.25% + 1 - 2%	--		
	Ronnel	0.5%	--		
Mosquitoes	See page 186 for control measures.				
Silverfish and firebrats	Chlordane	2 - 3%	5% or 6%	Paint or spray baseboards, door and window casings, closets, and places where pipes go through walls or floors. Dust behind baseboards and in out-of-sight areas.	Use on limited areas only (except DDT or ronnel, or malathion dust or 2% spray). Do not treat entire walls or floor. Do not contaminate food, water, dishes, or utensils. Do not allow children or pets near treated surfaces until spray has dried.
	DDT	5%	5% or 10%		
	Diazinon	0.5%	--		
	Dichlorvos	0.5%	--		
	Dieldrin	0.5%	1%		
	Heptachlor	0.5%	--		
	Lindane	0.5%	1%		
	Malathion	2 - 3%	4% or 5%		
	Ronnel	1%	--		

*Some formulations may be purchased ready to use; others must be prepared by diluting emulsifiable concentrates or wettable powders.
**May be purchased ready to use.
***May be resistant to DDT or methoxychlor.
****Available also in a resin strip.

INSECTS	INSECTICIDE	STRENGTH		WHERE AND HOW TO APPLY	REMARKS AND PRECAUTIONS
		SPRAY*	DUST**		
Spiders	Chlordane	2 - 3%	5% or 6%	Spray or dust webs and corners frequented by spiders.	Do not contaminate food, water, dishes, or utensils.
	Dichlorvos	0.5%	--		
	Dieldrin	0.5%	1%		
	Malathion	2 - 3%	4% or 5%		
	Ronnel	1%	--		
Ticks, including Brown dog tick (Rhipicephalus sanguineus)***	Chlordane	2 - 3%	5% or 6%	Spray, paint, or dust baseboards, door and window casings, edges of carpets, behind pictures and draperies, and all other possible hiding places.	Use on limited areas only (except DDT, or malathion dust or 2% spray). Do not treat entire walls or floor. Do not contaminate food, water, dishes, or utensils. Do not allow children or pets in treated areas until surfaces are dry. Supplement by treating dogs with a product labeled for such use.
	DDT	5%	--		
	Diazinon	0.5%	--		
	Dichlorvos	0.5%	--		
	Dieldrin	0.5%	1%		
	Lindane	0.5%	--		
	Malathion	2 - 3%	4% or 5%		
Wasps	DDT	5%	10%	Spray or dust nest, concentrating on nest openings.	Treat nests after dark, without lights, if possible. Use dusts or water-base sprays to avoid damaging vegetation. After treatment of underground nests, cover openings with moist dirt.
	Chlordane	2 - 3%	5% or 6%	Spray or dust nest, concentrating on nest openings, around windows and areas frequented by wasps.	
	Dieldrin	0.5%	1%		
	Dichlorvos	0.5%	--	Spray nest directly.	
	Heptachlor	0.5%	--		

*Some formulations may be purchased ready to use; others must be prepared by diluting emulsifiable concentrates or wettable powders.

**May be purchased ready to use.

***Brown dog tick (Rhipicephalus sanguineus) may be resistant to one or more of the following insecticides: Chlordane, DDT, dieldrin, or lindane.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
ANIMAL FEED--Concentrate blocks In bags Beetles and moths	Malathion	10	Oil soln. (premium grade)	100 mg./sq. ft. of bag surface	On packaging line, just before feed block enters bag. Spray nozzle deposits malathion on all interior surfaces of bag.	Do not use malathion on medicated blocks.
ANIMAL FEED--Citrus pulp In bags Beetles and moths	Malathion	50	WP (premium grade)	0.125 lb./1 gal./ 1,000 sq. ft.	Apply spray to all exposed surfaces of stack. Begin soon as stack is completed; repeat in 2 weeks and monthly thereafter. Discontinue when commodity temperature is below 60° F.	
ANIMAL FEED--Mixed grain In bags Beetles and moths	Pyrethrins + piperonyl butoxide	1 + 10	Oil soln. % by wt. Pyrethrins 0.2 + piperonyl butoxide 2.0 + tetrachloroethylene 50.0 + deodorized kerosene 47.8	0.006 + 0.06 lb./ 10,000 cu. ft. of airspace over the load.	Apply with thermal aerosol generator.	Do not release aerosol near an open flame.
			Pyrethrins 0.5 + piperonyl butoxide 5.0 + tetrachloroethylene 50.0 + deodorized kerosene 44.5	0.006 + 0.06 lb./ 10,000 cu. ft. of airspace over the load.	Apply with mechanical aerosol generator or as a mist spray.	
BURLAP BAGS In bales Beetles and moths	Methyl bromide	-	F	3 - 4 lb.	Before bags are used to store agricultural commodities, fumigate them on pallets in atmospheric chamber for 24 hr. Bags should not be tightly baled.	Fumigants should be applied only by a trained operator.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
BEANS, DRY						
In 100-lb. bags Weevils	Hydrogen cyanide	25	F	1.5 lb.	12 to 24 hr. at 60° F. or above in atmospheric chamber.	Fumigants should be applied only by a trained operator. Do not fumigate with hydrogen cyanide (HCN) at temperatures below 60° F. Aerate for 24 hours after treatment. Sample interstitial space with HCN test kit to measure concentrations.
				1.5 lb.	12 to 24 hr. at 60° F. or above under tarpaulin.	
				1.5 lb.	24 hr. at 60° F. or above in warehouse.	
				2 lb.	12 hr. at 60° F. or above in warehouse.	
	Methyl bromide	50 (inorganic bromide)	F	1.5 lb.	24 hr. at 60° F. or above in atmospheric chamber.	
				3 lb.	24 hr. at 40°- 60° F. in atmospheric chamber.	
				2 lb.	24 hr. at 60° F. or above under tarpaulin.	
				3 lb.	24 hr. at 40°- 60° F. under tarpaulin.	
				3 lb.	24 hr. at 60° F. or above in freight car.	
				4 lb.	24 hr. at 40°- 60° F. in freight car.	
				2 lb.	24 hr. at 60° F. or above in warehouse.	
				3 lb.	24 hr. at 40°- 60° F. in warehouse.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
BEANS, DRY(con.)						
In warehouses Flying insects	Pyrethrins + piperonyl butoxide	1 + 8	Oil soln. % by wt. Pyrethrins 0.2 + piperonyl butoxide 2.0 + tetrachloro-ethylene 50.0 + deodorized kerosene 47.8	0.006 + 0.06 lb./ 10,000 cu. ft. of airspace above the load.	Apply with thermal aerosol generator. Make first application right after beans come into warehouse. Second application, one week later. Apply every 2 weeks thereafter until mid-November.	Do not release aerosol near an open flame.
			Pyrethrins 0.5 + piperonyl butoxide 5.0 + tetrachloro-ethylene 50.0 + deodorized kerosene 44.5	0.006 + 0.06 lb./ 10,000 cu. ft. of airspace above the load.	Apply with mechanical aerosol generator. Make first application right after beans come into warehouse; second application one week later. Apply every 2 weeks thereafter until mid-November.	
				0.96 + 9.6 lb./ 10,000 sq. ft.	Apply as mist spray over load if beans are piled almost to roof.	
In packages Beetles and moths	Freezing	--	--	0° F. for 4 days	Put beans in home freezer soon after harvest.	
	Heating	--	--	120° F. for 0.5 hr.	In kitchen oven.	
BIRDSEED						
In bulk Beetles and moths	Pyrethrins + piperonyl butoxide	3 + 20	EC or oil soln.	0.06 + 0.6 lb./ 1,000 bu.	Mix insecticide throughout birdseed.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
CANDY						
In storage Beetles and moths	Cold storage	--	--	48° - 50° F.	Store in moisture-proof packages. Thaw in the unopened packages.	Candies containing nuts, butter, cream, or other fats become stale or rancid within 4 months
				32° - 34° F.		Candies containing nuts, coconut, chocolate or fatty materials will become rancid or stale within 1 year.
				0° F. or below.		High quality candy standards can be maintained for 9 months.
CARPETS (See FABRICS--Carpets)						
CEREAL PRODUCTS						
In the mill Beetles and moths	Heat sterilization	--	--	140° - 170° F. for 10 min.	Pack immediately after sterilization.	
In storage Beetles and moths	Hydrogen cyanide	90	F	1 - 3 lb. for 24 hr.	After exposure aerate for 24 hr.	Fumigants should be applied only by a trained operator. Use only on cereals that are to be cooked before eating
In packages Beetles and moths	Aluminum phosphide	0.1 *	F	45 - 60 tablets	5 days at 54° to 59° F.	Manufacturer of aluminum phosphide insists his representative train all first users. Aerate products 48 hours before offering to consumer. Do not fumigate when temperature remains below 40° F. Do not fumigate prepared mixes.
					4 days at 60° to 68° F.	
					3 days or more at above 68° F.	
				165 - 200 pellets	4 days at 54° to 59° F.	
					3 days at 60° to 68° F.	
					2 days or more at above 68° F.	

*On cereal flours and related products, except prepared mixes.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
CEREAL PRODUCTS (con.)						
Mills and warehouses for products Beetles and moths	Pyrethrins + piperonyl butoxide	1 + 10	Oil soln. % by wt. Pyrethrins 0.2 + piperonyl butoxide 2.0 + tetrachloroethylene 50.0 + deodorized kerosene 47.8	0.006 + 0.06 lb.	Apply with thermal aerosol generator.	Do not release aerosol near an open flame.
			Pyrethrins 0.5 + piperonyl butoxide 5.0 + tetrachloroethylene 50.0 + deodorized kerosene 44.5	0.006 + 0.06 lb.	Apply as a mist spray or use a mechanical aerosol generator.	
In packages in the home Beetles and moths	Freezing	--	--	0° F. for 4 days.	In home freezer.	
	Heating	--	--	120° F. for 0.5 hr.	In kitchen oven.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
CEREAL PRODUCTS--Corn grits						
In bags Beetles and moths	Carbon disulfide + carbon tetrachloride + normal pentane (17.2:82.3:0.5 mixture)	--	F	3 - 7 gal./1,000 bu.	Fumigate before shipping or in railroad cars.	Fumigants should be applied only by a trained operator. Use only on brewers grits used in the production of fermented malt beverages.
	Ethylene dichloride + carbon tetrachloride (70.2:29.8 mixture)	--				
CEREAL PRODUCTS--Cracked rice						
In bags Beetles and moths	Carbon disulfide + carbon tetrachloride + normal pentane (17.2:82.3:0.5 mixture)	--	F	3 - 7 gal./1,000 bu.	Fumigate before shipping or in railroad cars.	
	Ethylene dichloride + carbon tetrachloride (70.2:29.8 mixture)	--				
COCOA BEANS						
In bins Tobacco moth (Ephestia elutella)	Hydrogen cyanide	25	F	1 - 2.5 lb.	12-hr. exposure, followed by 24-hr. aeration.	Fumigants should be applied only by a trained operator.
	Methyl bromide	50 (inorganic bromide)	F	2 lb.	Fumigant must be recirculated. Expose for 24 hr.	

STORED-PRODUCT INSECTS

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
COCOA--Powdered In packages Tobacco moth (Ephestia elutella)	Hydrogen cyanide	200	F	0.5 lb.	24-hr. exposure, followed by 72-hr. aeration.	Fumigants should be applied only by a trained operator.
	Propylene oxide	300 (propylene oxide)	F		Follow manufacturer's directions on label.	
COPRA In ship's holds Beetles and moths	Ethylene oxide	50	F	75 p.p.m.	Fumigant is applied twice in ship's hold while enroute to U. S. port of entry.	
DRIED FRUITS--Apple In bulk Beetles and moths	Methyl bromide	30 (inorganic bromide)	F	1 lb.	24 hr. at 60° F. or above in atmospheric chamber.	Fumigants should be applied only by a trained operator. Do not fumigate with methyl bromide more than 2 times.
				1.5 lb.	24 hr. at 50° to 59° F. in atmospheric chamber.	
In storage Beetles and moths	Cold storage	--	--	32°- 40° F. and 55%-65% relative humidity.	Storage life is about 1 year.	
DRIED FRUITS--Apricot In bulk Beetles and moths	Methyl bromide	30 (inorganic bromide)	F	1 lb.	24 hr. at 60° F. or above in atmospheric chamber.	
				1.5 lb.	24 hr. at 50° to 59° F. in atmospheric chamber.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
DRIED FRUITS--Apricot (con.)						
In storage Beetles and moths	Cold storage	--	--	32°- 40° F. and 55%-65% relative humidity.	Storage life is about 1 year.	Fumigants should be applied only by a trained operator.
DRIED FRUITS--Currant (Zante)						Do not fumigate dates more than 6 times with methyl bromide.
In 1-lb. cartons Beetles and moths	Ethyl formate or methyl formate	250	F	0.3 ml./lb.	Just before sealing.	
In 30-lb. bulk cases Beetles and moths	Ethyl formate or methyl formate	250	F	5 ml./case	During summer in cases before sealing.	
				7 ml./case	During winter in cases before sealing.	
DRIED FRUITS--Date						
In boxes Beetles and moths	Methyl bromide	100 (inorganic bromide)	F	1 lb.	24 hr. at 60° F. or above in atmospheric chamber.	
				1.5 lb.	24 hr. at 50°- 59° F. in atmospheric chamber.	
DRIED FRUITS--Date (sucrose or hard type)						
In storage Beetles and moths	Cold storage	--	--	0° F.	Storage life is more than 1 year.	
				32° F. and 70 - 75% relative humidity.	Storage life up to 6 months.	

STORED-PRODUCT INSECTS

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
DRIED FRUITS-- Date (soft or invert sugar type)						Fumigants should be applied only by a trained operator.
In storage Beetles and moths	Cold storage	--	--	0°- 10° F.	Storage life 9 - 12 months.	
				28°- 32° F.	Storage life 6 months.	
DRIED FRUITS-- Fig						Do not fumigate figs more than 10 times with methyl bromide.
In boxes Beetles and moths	Methyl bromide	250 (inorganic bromide)	F	1 lb.	24 hr. at 60° F. or above in atmospheric chamber.	
				1.5 lb.	24 hr. at 50° - 59° F. in atmospheric chamber.	
In storage Beetles and moths	Cold storage	--	--	32°- 40° F. and 50%- 60% relative humidity.	Storage life up to 1 year. Low humidity controls sugaring.	
				55° F. or below	Darkening prevented for 5 months. Low humidity controls sugaring.	
DRIED FRUITS-- Glacé						
In packages Beetles and moths	Propylene oxide	700 (propylene glycol)	F	--	Follow manufacturer's directions on label.	
DRIED FRUITS-- Peach						Do not fumigate peaches more than 2 times with methyl bromide.
In bulk Beetles and moths	Methyl bromide	50 (inorganic bromide)	F	1 lb.	24 hr. at 60° F. or above in atmospheric chamber.	
				1.5 lb.	24 hr. at 50°- 59° F. in atmospheric chamber.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
DRIED FRUITS-- Peach (sundried) In storage Beetles and moths	Cold storage	--	--	32° F. and 55 - 65% relative humidity.		Fumigants should be applied only by a trained operator.
DRIED FRUITS-- Peach (dehydrated) In storage Beetles and moths	Cold storage	--	--	32°- 40° F. and 55%- 75% relative humidity.		
DRIED FRUITS-- Pear In bulk Beetles and moths	Methyl bromide	30 (inorganic bromide)	F	1 lb.	24 hr. at 60° F. or above in atmospheric chamber.	
				1.5 lb.	24 hr. at 50°- 59° F. in atmospheric chamber.	Do not fumigate pears more than 2 times nor prunes more than 3 times with methyl bromide.
In storage Beetles and moths	Cold storage	--	--	32°- 40° F. and 55%- 65% relative humidity.	Storage life is about 1 year.	
DRIED FRUITS-- Prune In bulk Beetles and moths	Methyl bromide	20 (inorganic bromide)	F	1 lb.	24 hr. at 60° F. or above in atmospheric chamber.	
				1.5 lb.	24 hr. at 50°- 59° F. in atmospheric chamber.	
In packages Beetles and moths	Propylene oxide	700 (propylene glycol)	F	--	Follow manufacturer's directions on label.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
DRIED FRUITS-- Prune (con.)						
In storage Beetles and moths	Cold storage	--	--	32°- 40° F. and 50%- 60% relative humidity.	Storage life is about 1 year.	Fumigants should be applied only by a trained operator. Do not fumigate raisins more than 10 times with methyl bromide.
				32°- 40° F. and 75%- 80% relative humidity.	Storage life is 4 - 5 months.	
DRIED FRUITS-- Raisin (un-processed)						
Drying Beetles and moths	Malathion	8	WP, slurry, or oil soln. (premium grade)	200 mg./per sq. ft.	Apply to paper trays intended for use only in the drying of grapes (raisins).	
In boxes Beetles and moths	Methyl bromide	100 (inorganic bromide)	F	1 lb.	24 hr. at 60° F. or above in covered stacks.	
				1.5 lb.	24 hr. at 50°- 59° F. in covered stacks.	
Under raisin stack covers Lead-cable borer (Scobicia declivis)	Malathion	--	WP (premium grade)	0.5 lb./1,000 sq. ft.	Apply to height of 8 feet on stack covers.	
In processing plant Beetles and moths	Cleaning with shaker machine	--	--	--	Raisins may be passed over shaker screen before storage.	
	Malathion	--	EC or WP (premium grade)	0.5 lb./1,000 sq. ft.	Spray at least every 30 days throughout warm season. Malathion breaks down rapidly on concrete surfaces.	

STORED-PRODUCT INSECTS

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
DRIED FRUITS--Raisins (processed)						
In 1-lb. cartons Beetles and moths	Ethyl formate or methyl formate	250	F	0.3 ml./lb.	Just before sealing.	Fumigants should be applied only by a trained operator.
In bulk 30-lb. cases Beetles and moths	Ethyl formate or methyl formate	250	F	5 ml./case	During summer in cases just before sealing.	
				7 ml./case	During winter in cases just before sealing.	
In storage Beetles and moths	Cold storage	--	--	32°- 40° F. and 50%- 60% relative humidity.	Storage life is about 1 year if moisture content is not above 15 - 20%.	
DRY MILK						
In packages Dermestids	Inspection	--	--	--	Make certain that no insects are on multiwall paper bags or in drums or barrels before they are filled with dry milk.	

STORED-PRODUCT INSECTS

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
DRY MILK (con.)						
In processing plant Beetles and moths	Malathion	0	1 pint 57% EC (premium grade) per 2.5 gal. water 1.5 lb. 25% WP (premium grade) per 2.5 gal. water	To point of runoff.	Apply as coarse spray to all places where insects might hide or crawl. Spray every month and immediately after vacuuming and cleaning, between April 1 and November 1 in cold areas, and throughout the year in warmer areas. Malathion breaks down rapidly on concrete surfaces.	Do not get insecticide in milk or on any utensil, equipment, container, or work surface that will come into direct contact with the milk.
	Malathion	0	D (4 - 5% premium grade)	Light application.	With a blower, blow dust into cracks and behind or underneath equipment, or around electrical connections where liquids would cause short circuits.	
	Pyrethrum + piperonyl butoxide	--	Oil soln. (pyrethrum 0.2% + piperonyl butoxide 2.0%)	To point of runoff.	For direct contact with insects; there is little residual toxicity. Spray in areas where insects are observed. Aerosols are not recommended.	
	Pyrethrins + synergist	0	D (0.5-1%)	Light application.	With a blower, blow dust into cracks and behind or underneath equipment, or around electrical connections where liquids would cause short circuits.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
FABRICS--Carpets In the home Clothes moths and carpet beetles	DDT	--	Oil soln. (5%)	1.5 - 2 qt. on average 9' x 12' rug.	Apply spray to entire surface. Repeat each 18 months; especially on areas receiving heavy traffic.	Avoid breathing sprays. Wash hands and face after application.
	Naphthalene or paradichlorobenzene	--	Balls, flakes, or crystals	Minimum: 1 lb./100 cu. ft.	Apply over entire area of carpet. Roll carpet and wrap in several layers of heavy paper. Protection lasts 6 to 8 months if end seals are airtight.	Protect food and utensils during application of insecticides.
FABRICS--Furnishings In the home Clothes moths and carpet beetles	DDT, Methoxychlor, Perthane, or Strobane	--	Formulations vary according to manufacturer.	Follow manufacturer's directions on label.	Hang woolens on clothesline. Spray lightly and uniformly until surface is moist. Do not soak fabric. Remove excess deposit by light brushing. Let woolens dry before storing them. Repeat annually.	
FABRICS--Infested areas In the home Clothes moths and carpet beetles	Chlordane	--	Oil soln. (2%)	To point of runoff.	Apply as coarse mist spray along cracks and crevices, in corners, along baseboards and moldings, in closets, and along carpet edges. Repeat each 6 months, or as required to prevent reinfestation.	
	DDT *	--	Oil soln. (3 - 6%)			
	Diazinon	--	Oil soln. (0.5% premium grade)			
	Lindane	--	Oil soln. (0.5% premium grade)			
	Malathion	--	Oil soln. (3 - 5% premium grade)			
	Ronnel	--	Oil soln. (3 - 5% premium grade)			

* DDT is effective against clothes moths only; other chemicals are effective against both clothes moths and carpet beetles.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
FABRICS--Woolen						
In the home Clothes moths and carpet beetles	DDT, methoxychlor, Perthane, or Strobane	--	Formulations vary according to manufacturer.	Follow manufacturer's directions on label.	Hang woolens on clothesline. Spray lightly and uniformly until surface is moist. Do not soak fabric. Remove excess deposit by light brushing. Let woolens dry before storing them. Repeat annually.	Avoid breathing sprays. Wash hands and face after application. Fumigants should be applied only by a trained operator.
	Drycleaning fluids	--	Soln.	--	Dryclean in usual manner. Drycleaning kills all stages of insects, but does not prevent reinfestation.	
	Naphthalene or paradichlorobenzene	--	Balls, flakes, or crystals	Minimum: 1 lb./100 cu. ft. of space.	Scatter chemical over and between woolens. Box or closet must be sealed tightly to confine vapors throughout entire storage period. In closets, replenish insecticide periodically to maintain proper quantity. If storage is in sealed boxes and exceeds 1 year, open boxes each spring and apply fresh insecticide.	
	Storage in cedar chest	--	Vapor from cedar wood		Dryclean woolens and store in cedar chest. Keep chest closed tightly. Vapors are effective against young larvae only. Effectiveness is lost after 1 - 2 years.	
FLOUR						
In bulk Beetles and moths	Entoleter	--	--	--	Flour being milled is run through Entoleter machine.	
In bags in warehouse Beetles and moths	Hydrogen cyanide	125	F	1 lb.	General cleanup purposes. To kill insects in the open space and in outer portions of bagged material.	
(See also CEREAL PRODUCTS)						

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
FLOUR (con.)						
Flour mill Beetles and moths	Chloropicrin	--	F	1.25 - 1.75 lb.	Once a year, fumigate flour mill. Expose for 24 hours.	Fumigants should be applied only by a trained operator.
	Hydrogen cyanide	--	F	0.5 - 1.0 lb.		
	Methyl bromide	--	F	1 lb.		
	Sanitation program	--	--	--	Vacuum cleaning.	
Milling machinery Beetles and moths	Pyrethrins + piperonyl butoxide	1 + 10	Oil soln.	0.2 + 2.0%	Spray machinery to point of runoff. Flour will pick up some residue from contact with treated surfaces.	
	Carbon tetrachloride + ethylene dichloride + ethylene dibromide (21:64:15 mixture)	--	F	12 - 16 oz. in elevator boots.	Spot fumigation in milling machinery. Apply every 2 or 3 weeks, then clean out machine with vacuum cleaner.	
				16 - 20 oz. in reels and purifier conveyors.		
	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	--		12 oz. in each section of sifters.		
				2 oz. per linear foot in conveyors.		
				8 oz. for each side of rolls.		
				16 oz. in dusters.		
				10 oz. per 100 cu. ft. in bins.		

STORED-PRODUCT INSECTS

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
FLOUR (con.)						
In packages in the home Beetles and moths	Freezing	--	--	0° F. for 4 days.	Whenever infestation is suspected, hold packages in home freezer until all insect life is killed. Store in insect-proof containers such as glass jars.	
	Heating	--	--	120° F. for 0.5 hr.	Store in glass or metal containers.	
FREIGHT CAR						
Interior of empty car prior to loading with commodities Beetles and moths	Allethrin 0.5%	--	EC or WP	0.08 lb./1,000 sq. ft.	Residual spray.	
	Malathion	8*	EC (premium grade)	0.45 lb./1,000 sq. ft.		
	Methoxychlor 2.5%	2 on grain	EC or WP	0.4 lb./1,000 sq. ft.		
	Pyrethrins + piperonyl butoxide	1 + 8 ** 3 + 20 ***	EC or WP	0.08 lb./1,000 sq. ft.		

* On grain and peanuts only.
** Beans, peas, oats, sorghum, almonds, peanuts, walnuts, cocoa beans, pecans, copra, flaxseed.
*** Barley, buckwheat, corn, popcorn, rice, rye, wheat, birdseed.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
FURNISHINGS (See FABRICS--Furnishings)						
FUR In the home Clothes moths and carpet beetles	Cold storage	--	--	34°-40° F. and 44%-55% relative humidity.	Professional storage is advisable.	
GRAIN-Barley (See GRAIN--Corn, shelled)	Control measures for insects in stored barley are the same as in Grain -- Corn, shelled, pages 208 - 213.					
GRAIN-Corn, shelled In concrete or metal upright bins, 3,200-bu. metal bins, or farm-type metal bins Beetles and moths	Aluminum phosphide	No-residue basis	F	3 tablets/ton or 90 tablets/1,000 bu.	Mix into grain. Fumigate at 70° F. or above for 3 days.	Manufacturer of aluminum phosphide tablets insists his representative train all first users. Do not recirculate aluminum phosphide.
	Calcium cyanide	25 (hydrogen cyanide)	F	12 lb./1,000 bu.	Mix into grain stream above 70° F.	Fumigants should be applied only by a trained operator.
				15 lb./1,000 bu.	Mix into grain stream below 70° F.	Do not apply calcium cyanide to white corn or apply it in wooden bins.

Continued

STORED-PRODUCT INSECTS

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Corn, shelled (con.)						
In concrete or metal upright bins, 3,200-bu. metal bins, or farm-type metal bins (con.) Beetles and moths	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt	F	3 gal./1,000 bu. *	Gravity distribution. Surface application or layering method. Above 60° F.	Fumigants should be applied only by a trained operator.
				4 gal./1,000 bu. *	Gravity distribution. Surface application or layering method. Below 60° F.	Aerate after fumigation with chloropicrin.
				1.5 gal.*	Forced distribution fumigation. Closed recirculation or single-pass. Above 60° F.	
				2 gal. *	Forced distribution fumigation. Closed recirculation or single-pass. Below 60° F.	
	Chloroform + carbon disulfide + ethylene dibromide	50 (inorganic bromide) Others exempt	F	1.5 gal./1,000 bu.*	Above 70° F.	
				2.5 gal./1,000 bu.*	Below 70° F.	
	Chloropicrin	Exempt	F	3 lb./1,000 bu. *	Gravity distribution. Surface application. Above 70° F.	
				4 lb./1,000 bu. *	Gravity distribution. Surface application. Below 70° F.	
	Chloropicrin + methyl chloride (85:15 mixture)	Exempt	F	2 lb. *	Forced distribution fumigation. Closed recirculation or single-pass. Above 70° F.	
				3 lb. *	Forced distribution fumigation. Closed recirculation or single-pass. Below 70° F.	

Continued

* Double the dosage if used in wooden bins.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN-Corn, shelled (con.)						
In concrete or metal upright bins, 3,200-bu. metal bins, or farm-type metal bins (con.) Beetles and moths	Ethylene dibromide + methyl bromide (70:30 mixture)	50 (inorganic bromide) + Exempt (organic bromide)	F	24 - 36 oz./1,000 bu. *	Gravity distribution fumigation. Surface application or layering method. Above 70° F. in farm-type bins.	Fumigants should be applied only by a trained operator.
				30 oz./1,000 bu.	Probe fumigant into hotspot.	
	Ethylene dibromide + methyl bromide (30:70 mixture)	50 (inorganic bromide) + Exempt (organic bromide)	F	1.125 - 1.5 lb. *	Forced distribution fumigation. Closed recirculation or single-pass. Above 70° F.	
				2 - 3 lb. *	Forced distribution fumigation. Closed recirculation or single-pass. Below 70° F.	
	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F	4.5 gal./1,000 bu.*	Gravity distribution. Surface application or layering method. Above 70° F.	
				5.5 gal./1,000 bu.*	Gravity distribution. Surface application or layering method. Below 70° F.	
				2.5 gal. *	Forced distribution fumigation. Closed recirculation or single-pass. Above 70° F.	
				3.5 gal. *	Forced distribution fumigation. Closed recirculation or single-pass. Below 70° F.	
	Ethylene dibromide + ethylene dichloride + carbon tetrachloride (5: 35: 60 mixture)	50 (inorganic bromide) Others exempt	F	4 - 5 gal./1,000 bu.*	Gravity distribution. Surface application or layering method. Above 70° F.	

Continued

* Double the dosage if used in wooden bins.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN-Corn, shelled (con.)						
In concrete or metal upright bins, 3,200-bu. metal bins, or farm-type metal bins (con.) Beetles and moths	Hydrogen cyanide	100	F	3 lb. *	Forced distribution fumigation. Closed recirculation or single-pass.	Fumigants should be applied only by a trained operator.
	Methyl bromide	50 (inorganic bromide)	F	2 lb. *	Forced distribution fumigation. Closed recirculation or single-pass. Above 60° F. for 24 hours.	Aerate after fumigation with methyl bromide.
				3 lb. *	Forced distribution fumigation. Closed recirculation or single-pass. Below 60° F. for 24 hours.	
In flat storage Beetles and moths	Aluminum phosphide	No-residue basis	F	3 tablets/ton or 90 tablets/1,000 bu.	Probe tablets into corn. Fumigate at 70° F. or above for 3 days.	Manufacturer of aluminum phosphide tablets insists his representative train all first users. Do not recirculate aluminum phosphide.
	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt	F	1.5 gal.	Forced distribution fumigation. Closed recirculation or single-pass. Above 60° F.	Fumigants should be applied only by a trained operator.
				2 gal.	Forced distribution fumigation. Closed recirculation or single-pass. Below 60° F.	
	Chloroform + carbon disulfide + ethylene dibromide (71.25: 23.75: 5.0 mixture)	Exempt Exempt 50 (inorganic bromide Exempt (organic bromide)	F	2 gal./1,000 bu.	Above 70° F.	
				3 gal./1,000 bu.	Below 70° F.	

Continued

* Double the dosage if used in wooden bins.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Corn, shelled (con.)						
In flat storage (con.) Beetles and moths	Chloropicrin + methyl chloride (85:15 mixture)	Exempt	F	2 lb.	Forced distribution fumigation. Closed recirculation or single-pass. Above 70° F.	Fumigants should be applied only by a trained operator.
				3 lb.	Forced distribution fumigation. Closed recirculation or single-pass. Below 70° F.	
	Ethylene dibromide + methyl bromide (30:70 mixture)	50 (inorganic bromide) Exempt (organic bromide)	F	1.125 - 1.5 lb.	Forced distribution fumigation. Closed recirculation or single-pass. Above 70° F.	
				2 - 3 lb.	Forced distribution fumigation. Closed recirculation or single-pass. Below 70° F.	Aerate after fumigation with methyl bromide.
	Ethylene dibromide + methyl bromide (70:30 mixture)	50 (inorganic bromide)	F	30 oz./1,000 bu.	Probe fumigant into hotspot.	
	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F	9 gal./1,000 bu.	Gravity distribution fumigation. Above 70° F.	
				10 gal./1,000 bu.	Gravity distribution fumigation. Below 70° F.	
				2.5 gal.	Forced distribution fumigation. Closed recirculation or single-pass. Above 70° F.	
				3.5 gal.	Forced distribution fumigation. Closed recirculation or single-pass. Below 70° F.	
	Ethylene dibromide + ethylene dichloride + carbon tetrachloride (5: 35: 60 mixture)	50 (inorganic bromide) Others exempt	F	5 gal./1,000 bu.	Gravity distribution fumigation. Above 70° F.	

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Corn, shelled (con.)						
In flat storage (con.) Beetles and moths	Hydrogen cyanide	100	F	3 lb.	Forced distribution fumigation. Closed recirculation or single-pass.	Fumigants should be applied only by a trained operator.
	Methyl bromide	50 (inorganic bromide)	F	2 lb.	Forced distribution fumigation. Closed recirculation or single-pass. Above 60° F. for 24 hours.	Aerate after fumigation with methyl bromide.
				4 lb.	Forced distribution fumigation. Closed recirculation or single-pass. Below 60° F. for 24 hours.	
In bulk, in freight cars.	Ethylene dibromide + ethylene dichloride + carbon tetrachloride (5: 35: 60 mixture)	50 (inorganic bromide) Others exempt	F	8 gal./car	Apply from outside of car using hand or power sprayer.	
GRAIN--Corn, shelled or ear						
In warehouses Beetles and moths	Malathion	8	EC (premium grade)	0.63 lb./1,000 bu.	Spray into grain stream as it goes into storage. Mix with water--3 - 5 gal./ 1,000 bu.	Soft, insect-susceptible varieties are difficult to protect. The dust will cause downgrading of market corn.
	Pyrethrins + piperonyl butoxide	3 + 20 corn 1 + 8 oats	D	0.05 + 0.8 lb./ 1,000 bu.	Protectant dust. Before corn is infested, when moisture content is 12% or less.	
			EC or oil soln.	0.06 + 0.6 lb./ 1,000 bu.	Spray into grain stream as it goes into storage. Mix with water-- 3 - 5 gal./ 1,000 bu.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Corn, ear						
In wooden crib bins Beetles and moths	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt	F	6 gal./1,000 bu.	Distribute fumigant evenly over surface. Bins must be made gastight.	Fumigants should be applied only by a trained operator. Aerate after fumigation with methyl bromide.
	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F	6 gal./1,000 bu.	Distribute fumigant evenly over surface. Bins must be made gastight.	
In perforated steel crib bins Beetles and moths	Methyl bromide	50 (inorganic bromide)	F	2 lb.	Cover crib with gastight tarpaulin. Above 60° F. for 24 hours.	
In bulk Indian-meal moth (Plodia interpunctella)	Mineral oil	200	S	2 qt./100 sq. ft. of surface or 2.5 qt./3,300-bu. bin.	Protective treatment with oil spray on surface. In North: first application after grain is fumigated; second in July or August. In South: first application after fall harvest following fumigation; second in April or May of next year.	
In bags in warehouse Beetles and moths	Chloropicrin + methyl chloride (85:15 mixture)	Exempt	F	2 lb.	Space fumigation. Above 70° F.	
				4 lb.	Space fumigation. Below 70° F.	
	Hydrogen cyanide	100	F	3 lb.	Space fumigation.	
	Methyl bromide	50 (inorganic bromide)	F	2 lb.	Space fumigation. Above 60° F. for 24 hours.	
				4 lb.	Space fumigation. Below 60° F. for 24 hours.	
GRAIN--Oats (See GRAIN--Corn, shelled)	Control measures for insects in stored oats are the same as in Grain -- Corn, shelled, pages 208 - 213.					

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE (*p. p. m.*)	FORMULATION	DOSAGE (*active ingredient per 1,000 cu. ft. unless otherwise stated*)	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN-Popcorn						
In wooden or metal bins Beetles and moths	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt	F	5 gal./1,000 bu.	Distribute fumigant evenly over surface. Bins must be made gastight.	Fumigants should be applied only by a trained operator.
	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F	5 gal./1,000 bu.		
In wooden crib bins Beetles and moths	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt	F	6 gal./1,000 bu.		
	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F	6 gal./1,000 bu.		
In perforated steel crib bins Beetles and moths	Methyl bromide	240 (inorganic bromide)	F	2 lb.	Cover crib with gastight tarpaulin. Above 60° F. for 24 hr.	
In bulk, in packer bins with circulation systems Beetles and moths	Methyl bromide	240 (inorganic bromide)	F	1.5 lb.	Recirculation fumigation. 70° F. or above for 24 hr.	Aerate after fumigation with methyl bromide.
				2 lb.	Recirculation fumigation. 60°- 69° F. for 24 hr.	
				2.5 lb.	Recirculation fumigation. 50°- 59° F. for 24 hr.	
				3 lb.	Recirculation fumigation. 40°- 49° F. for 24 hr.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN-Popcorn						
In bags, in warehouses, in fumigation chambers, or under tarpaulins Beetles and moths	Hydrogen cyanide	100	F	1 lb.	Perforated steel cribs should be covered with tarpaulins. Fumigate at 70° F. or above for 24 hr.	Fumigants should be applied only by a trained operator.
	Methyl bromide	240 (inorganic bromide)	F	1.5 lb.		Aerate after fumigation with methyl bromide.
In bags, in freight cars Beetles and moths	Methyl bromide	240 (inorganic bromide)	F	16 lb. in refrigerator car.	Fumigate for 24 hr.	
				14 lb. in wooden car.		
				10 lb. in steel car.		
In small lots Beetles and moths	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt	F	1 oz. in 100-lb. metal can.	Distribute fumigant evenly over surface and expose for 24 hr.	
	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F			
GRAIN-Rice, rough						
In bulk Beetles and moths	Aluminum phosphide	No-residue basis	F	90 tablets/440 cwt.	Flat storage or in bins. Feed tablets into grain stream or insert into grain mass. Fumigate at 70° F. or above for 3 days.	Manufacturer of aluminum phosphide tablets insists his representative train all first users. Do not recirculate aluminum phosphide.

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN-Rice, rough, (con.)						
In bulk (con.) Beetles and moths	Calcium cyanide	25 (hydrogen cyanide)	F	12 lb./440 cwt.	In concrete or metal elevator bins.	Fumigants should be applied only by a trained operator.
				24 lb./440 cwt.	In wooden cribbed bins.	
	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt	F	4 - 5 gal./440 cwt.	Spot fumigation.	Aerate after fumigation with methyl bromide.
				2.5 gal./440 cwt.	In metal bins on farms, or in concrete or metal elevator bins.	Do not fumigate with methyl bromide more than 2 times.
				4 gal./440 cwt.	In wooden bins on farms, or in elevator or wooden cribbed bins.	
	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F	3 gal./440 cwt.	In metal bins on farms, or in concrete or metal elevator bins.	
				6 gal./440 cwt.	In wooden bins on farms, or in elevator or wooden cribbed bins.	
	Malathion	8	EC (premium grade)	0.63 lb./440 cwt.	Treat as rice is being placed in storage.	
	Methyl bromide	50 (inorganic bromide)	F	1.5 - 2 lb.	Flat storage in warehouse. Use recirculation.	
	Pyrethrins + piperonyl butoxide	3 + 20	EC	0.2 + 2.0 lb./ 440 cwt.	Apply as bulk treatment by spraying rice on conveyor as it is placed in bin or before it is sacked.	
Moths	Methyl bromide	50 (inorganic bromide)	F	1 lb.	Expose for 16 - 24 hr., at 60° F., or above. Dosage calculated from overhead space only.	

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN-Rice, rough, (con.)						
In bulk (con.) Moths	Pyrethrins + piperonyl butoxide	3 + 20	Oil soln. % by wt. Pyrethrins 0.2 + piperonyl butoxide 2.0 + tetrachloroethylene 50.0 + deodorized kerosene 47.8	0.006 + 0.06 lb./ 10,000 cu. ft. of airspace over the load.	Apply with thermal aerosol generator.	Do not release aerosol near open flames.
			Pyrethrins 0.5 + piperonyl butoxide 5.0 + tetrachloroethylene 50.0 + deodorized kerosene 44.5	0.006 + 0.06 lb./ 10,000 cu. ft. of airspace over the load.	Apply with mechanical aerosol generator or as a mist spray.	
In bags or in bulk Beetles and moths	Hydrogen cyanide	100	F	3.5 lb.	72-hr. exposure.	
	Methyl bromide	50 (inorganic bromide)	F	10 - 12 lb. per car.	Steel freight car.	Fumigants should be applied only by a trained operator.
				12 - 15 lb. per car.	Wooden freight car.	Aerate after fumigation with methyl bromide.
In bags Beetles and moths	Aluminum phosphide	No-residue basis	F	90 tablets	Expose for 3 days under tarpaulins at 70° F. or above. Place tablets on metal trays at each corner of stack under tarpaulin.	Manufacturer of aluminum phosphide tablets insists his representative train all first users. Do not recirculate aluminum phosphide. Do not fumigate when temperature remains below 40° F.

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN-Rice, rough (con.) In bags (con.) Beetles and moths	Hydrogen cyanide	100	F	First dose, 3 lb.; second dose, 2 lb.	Fumigate under tarpaulin or plastic sheet. Apply second dose 1 month after first. Leave covers on for several months.	Fumigants should be applied only by a trained operator.
				3.5 lb.	Under tarpaulins at 70° F. and above for 72 hours.	Do not fumigate more than 2 times with methyl bromide.
	Methyl bromide	50 (inorganic bromide)	F	1.5 lb.	Expose for 24 hr. under tarpaulins at 70° F. and above.	Aerate after fumigation.
				1.25 lb.	Warehouse fumigation. Expose for 16 - 24 hr.	Rice under tarpaulin should be aerated before unloading.
GRAIN-Rice, milled In bulk Beetles and moths	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt	F	2 gal./440 cwt.	Concrete elevator bins.	Do not use calcium cyanide on milled rice as it is likely to cause spotting.
	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F	3 gal./440 cwt.		
	Hydrogen cyanide	100	F	3.5 lb.	Warehouse fumigation. Use recirculation. Expose for at least 72 hours.	
	Methyl bromide	50 (inorganic bromide)	F	1 lb.	Fumigation in packer bins for 15 hours. Circulate the gas by fan for 15 - 20 min.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE (*p. p. m.*)	FORMULATION	DOSAGE (*active ingredient per 1,000 cu. ft. unless otherwise stated*)	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN-Rice, milled (con.)						
In bags Beetles and moths	Hydrogen cyanide	100	F	1.5 oz./1,000 lb. 2.5 lb.	4 hr. in atmospheric chamber at 80° F. or above.	Fumigants should be applied only by a trained operator.
				1 oz./1,000 lb. 1.5 lb.	15 hr. in atmospheric chamber at 80° F. or above.	Aerate after fumigation with methyl bromide.
	Methyl bromide	50 (inorganic bromide)	F	1 lb.	Warehouse fumigation. Expose for 16 - 24 hours.	
				1.5 oz./1,000 lb. 1.75 lb.	4 hr. in atmospheric chamber at 70° F. or above.	
				1 oz./1,000 lb. 1.5 lb.	6 hr. in atmospheric chamber at 70° F. or above.	
				0.5 oz./1,000 lb. 0.75 lb.	12 hr. in atmospheric chamber at 70° F. or above.	
				1.5 oz./1,000 lb. 3 lb.	2 hr. in vacuum chamber at 65° F. or above.	
				0.75 oz./1,000 lb. 2 lb.	3 hr. in vacuum chamber at 65° F. or above.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN-Rice, milled (con.)						
In bags and cartons Beetles and moths	Hydrogen cyanide	100	F	1.25 oz./1,000 lb. 1.75 lb.	3 hr. in vacuum chamber at 60° F. or above.	Fumigants should be applied only by a trained operator.
In cartons Beetles and moths	Methyl bromide	50 (inorganic bromide)	F	1.25 oz./1,000 lb. 1.75 lb.	15 hr. in atmospheric chamber at 70° F. or above.	Aerate after fumigation with methyl bromide.
				2 oz./1,000 lb. 2.5 lb.	2 hr. in vacuum chamber at 50° F. or above.	
				1.5 oz./1,000 lb. 3 lb.	3 hr. in vacuum chamber at 65° F. or above.	
				1.25 oz./1,000 lb. 2.5 lb.	12 hr. in vacuum chamber at 65° F. or above.	
In packages in the home Beetles and moths	Freezing	--	--		Soon after harvest, or whenever infestation is suspected, hold in freezer at 0° F. for 4 days. Store in insect-proof containers such as glass jars.	
	Heating	--	--		Soon after harvest, or whenever infestation is suspected, heat to 120° F. in oven. Hold for 0.5 hr. Store in insect-proof containers such as glass jars.	
GRAIN--Rye (See GRAIN--Wheat)	Control measures for insects in stored rye are the same as in Grain -- Wheat, page 228.					

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Sorghum						
In bulk, in concrete or metal elevator bins, 3,200-bu. metal bins, or farm-type metal bins Beetles and moths	Aluminum phosphide	No-residue basis	F	3 tablets/ton or 90 tablets/1,000 bu.	Mix into grain as it is being binned. Fumigate at 70° F. or above for 3 days.	Manufacturer of aluminum phosphide tablets insists his representative train all first users. Do not fumigate with aluminum phosphide when temperature remains below 40° F. Do not recirculate aluminum phosphide. Fumigants should be applied only by a trained operator. Do not apply calcium cyanide in wooden bins.
	Calcium cyanide	25 (hydrogen cyanide)	F	15 - 20 lb./1,000 bu. *	Mix into grain as it is being binned.	
	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt	F	4 gal./1,000 bu. *	Gravity distribution fumigation. Surface application or layering method. Above 70° F.	
	Chloroform + carbon disulfide + ethylene dibromide (71.25: 23.75: 5.0 mixture)	50 (inorganic bromide) Others exempt	F	4 gal./1,000 bu. *	Above 70° F.	
				5 gal./1,000 bu. *	Below 70° F.	
	Chloropicrin	Exempt	F	4 lb./1,000 bu. *	Above 70° F.	
				5 lb./1,000 bu. *	50°- 59° F.	
	Ethylene dibromide + ethylene dichloride + carbon tetrachloride (5: 35: 60 mixture)	50 (inorganic bromide) Others exempt	F	6 - 7 gal./1,000 bu*	Gravity distribution. Surface application or layering method. Above 70° F.	
	Ethylene dibromide + methyl bromide (70:30 mixture)	50 (inorganic bromide) Exempt (organic bromide)	F	36 - 60 oz./1,000 bu. *	In farm-type bins above 70° F.	
				48 oz./1,000 bu.	Probe fumigant into hotspot.	

Continued

* Double the dosage if used in wooden bins.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Sorghum (con.)						
In bulk, in concrete or metal elevator bins, 3,200-bu. metal bins, or farm-type metal bins (con.) Beetles and moths	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F	6 gal./1,000 bu. *	Gravity distribution fumigation. Surface application or layering method. Above 70° F.	Fumigants should be applied only by a trained operator.
				7 gal./1,000 bu. *	Gravity distribution fumigation. Surface application or layering method. Below 70° F.	
In bulk, in concrete or metal bins Beetles and moths	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt	F	2.5 gal.	Forced distribution fumigation. Closed recirculation and single-pass. Above 60° F.	
				4 gal.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 59° F.	
	Chloropicrin + methyl chloride (85:15 mixture)	Exempt	F	4 lb.	Forced distribution fumigation. Closed recirculation and single-pass. Above 70° F.	
				5 lb.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 59° F.	
	Ethylene dibromide + methyl bromide (30:70 mixture)	50 (inorganic bromide) Exempt (organic bromide)	F	2.25 - 3 lb.	Forced distribution fumigation. Closed recirculation and single-pass. Above 60° F.	
				4 lb.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 59° F.	
	Ethylene dibromide + ethylene dichloride + carbon tetrachloride (5: 35: 60 mixture)	50 (inorganic bromide) Others exempt	F	7 gal./1,000 bu.	Gravity distribution fumigation. Above 70° F.	

Continued

* Double the dosage if used in wooden bins.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Sorghum (con.)						
In bulk, in concrete or metal bins (con.) Beetles and moths	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F	4 gal.	Forced distribution fumigation. Closed recirculation and single-pass. Above 60° F.	Fumigants should be applied only by a trained operator.
				6 gal.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 59° F.	Aerate after fumigation with methyl bromide.
	Hydrogen cyanide	100	F	4 lb.	Forced distribution fumigation. Closed recirculation and single-pass.	
	Methyl bromide	50 (inorganic bromide)	F	3 lb.	Forced distribution fumigation. Closed recirculation and single-pass. Above 60° F.	
				5 lb.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 59° F.	
In bulk Indian-meal moth (Plodia interpunctella)	Mineral oil	200	--	2 qt./100 sq. ft. of surface or 2.5 qt./3,200-bu. bin.	Protective treatment with oil spray on surface. In South - First application after grain is fumigated; second in July or August. In North - First application after fall harvest following fumigation; second in April or May of next year.	
In bulk, in freight cars and van trucks Beetles and moths	Chloropicrin	Exempt	F	4 lb.	Recirculation fumigation. Above 70° F.	
				6 lb.	Recirculation fumigation. 50°- 69° F.	

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Sorghum (con.)						
In bulk, in freight cars and van trucks (con.) Beetles and moths	Hydrogen cyanide	100	F	4 lb.	Recirculation fumigation.	Fumigants should be applied only by a trained operator.
	Methyl bromide	50 (inorganic bromide)	F	4 lb.	Recirculation fumigation. Above 70° F.	
				6 lb.	Recirculation fumigation. 50°- 69° F.	Aerate after fumigation with methyl bromide.
	Ethylene dibromide + ethylene dichloride + carbon tetrachloride (5: 35: 60 mixture)	50 (inorganic bromide) Others exempt	F	12 gal./car	Apply from outside of car using hand or power sprayer.	Manufacturer of aluminum phosphide tablets insists his representative train all first users.
In flat storage Beetles and moths	Aluminum phosphide	No-residue basis	F	3 tablets/ton or 90 tablets/1,000 bu.	Gravity distribution fumigation. At 70° F. or above for 3 days.	Do not fumigate with aluminum phosphide when temperature remains below 40° F.
	Calcium cyanide	25 (hydrogen cyanide)	F	15 - 20 lb./1,000 bu.	Mix into grain as it is being placed in storage.	Do not recirculate aluminum phosphide.
	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt	F	7 gal./1,000 bu.	Gravity distribution fumigation. Above 70° F.	
				8 gal./1,000 bu.	Gravity distribution fumigation. 50°- 69° F.	
				2.5 gal.	Forced distribution fumigation. Closed recirculation and single-pass. Above 60° F.	
				4 gal.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 59° F.	

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Sorghum (con.)						
In flat storage (con.) Beetles and moths	Chloroform + carbon disulfide + ethylene dibromide (71.25: 23.75: 5.0 mixture)	50 (inorganic bromide) Others exempt	F	4 gal./1,000 bu.	Gravity distribution fumigation. Above 70° F.	Fumigants should be applied only by a trained operator.
				5 gal./1,000 bu.	Gravity distribution fumigation. 50°- 69° F.	Aerate after fumigation with methyl bromide.
	Chloropicrin + methyl chloride (85:15 mixture)	Exempt	F	4 lb.	Forced distribution fumigation. Closed recirculation and single-pass. Above 70° F.	
				5 lb.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 69° F.	
	Ethylene dibromide + methyl bromide (30:70 mixture)	50 (inorganic bromide) Exempt (organic bromide)	F	2.25 - 3 lb.	Forced distribution fumigation. Closed recirculation and single-pass. Above 70° F.	
				4 lb.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 69° F.	
	Ethylene dibromide + methyl bromide (70:30 mixture)	50 (inorganic bromide)	F	48 oz./1,000 bu.	Probe fumigant into hotspot.	

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE (*p. p. m.*)	FORMULATION	DOSAGE (*active ingredient per 1,000 cu. ft. unless otherwise stated*)	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Sorghum (con.)						
In flat storage (con.) Beetles and moths	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F	8 gal./1,000 bu.	Gravity distribution fumigation. Above 70° F.	Fumigants should be applied only by a trained operator.
				10 gal./1,000 bu.	Gravity distribution fumigation. 50°- 69° F.	Aerate after fumigation with methyl bromide.
				4 gal.	Forced distribution fumigation. Closed recirculation and single-pass. Above 60° F.	
				6 gal.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 59° F.	
	Hydrogen cyanide	100	F	4 lb.	Forced distribution fumigation. Closed recirculation and single-pass.	
	Methyl bromide	50 (inorganic bromide)	F	4 lb.	Forced distribution fumigation. Closed recirculation and single-pass. Above 60° F.	
				5 lb.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 59° F.	
In bags in warehouse Beetles and moths	Chloropicrin	Exempt	F	4 lb.	Space fumigation. Above 70° F.	Do not fumigate seed stock with chloropicrin.
				6 lb.	Space fumigation. 50°- 69° F.	
	Hydrogen cyanide	100	F	4 - 6 lb.	Space fumigation.	

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Sorghum (con.)						
In bags in warehouse (con.) Beetles and moths	Methyl bromide	50 (inorganic bromide)	F	4 lb.	Space fumigation. Above 60° F.	Fumigants should be applied only by a trained operator.
				6 lb.	Space fumigation. 50°- 59° F.	Aerate after fumigation with methyl bromide.
GRAIN--Wheat						
In bulk, in concrete or metal bins, farm-type metal bins, or large steel tanks Beetles and moths	Aluminum phosphide	No-residue basis	F	3 tablets/ton or 90 tablets/1,000 bu. *	Mix into grain. At 70° F. or above for 3 days.	Manufacturer of aluminum phosphide tablets insists his representative train all first users. Do not fumigate with aluminum phosphide when temperature remains below 40° F. Do not recirculate aluminum phosphide. Fumigants should be applied only by a trained operator.
	Calcium cyanide	25 (hydrogen cyanide)	F	12 - 15 lb./1,000 bu. *	Mix into grain.	
				20 lb./1,000 bu. *	Mix into grain. In 3,200-bu. metal bins.	
	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt	F	2 gal./1,000 bu. *	Gravity distribution fumigation. Above 70° F.	
				3 gal./1,000 bu. *	Gravity distribution fumigation. 50°- 69° F.	
				1.5 gal.	Forced distribution fumigation. Closed recirculation and single-pass. Above 60° F.	
				2 gal.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 59° F.	

Continued

* Double the dosage if used in wooden bins.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Wheat (con.)						
In bulk, in concrete or metal bins, farm-type metal bins, or large steel tanks (con.) Beetles and moths	Chloroform + carbon disulfide + ethylene dibromide (71.25: 23.75: 5.0 mixture)	50 (inorganic bromide) Others exempt	F	0.75 gal./1,000 bu. *	Gravity distribution fumigation. Above 70° F.	Fumigants should be applied only by a trained operator.
				1.25 gal./1,000 bu. *	Gravity distribution fumigation. 50°- 69° F.	
	Chloropicrin	Exempt	F	2 lb./1,000 bu. *	Mix into grain. Above 70° F.	
				3 lb./1,000 bu. *	Mix into grain. 50°- 69° F.	
	Chloropicrin + methyl chloride (85:15 mixture)	Exempt	F	2 lb.	Forced distribution fumigation. Closed recirculation and single-pass. Above 70° F.	
				3 lb.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 69° F.	
	Ethylene dibromide + ethylene dichloride + carbon tetrachloride (5: 35: 60 mixture)	50 (inorganic bromide) Others exempt	F	2 - 3 gal./1,000 bu.*	Gravity distribution. Surface application or layering method. Above 70° F.	
	Ethylene dibromide + methyl bromide (70:30 mixture)	50 (inorganic bromide) Exempt (organic bromide)	F	18 - 30 oz./1,000 bu. *	Gravity distribution fumigation. At 70° F. and above.	
				30 oz./1,000 bu.	Probe fumigant into hotspot.	

Continued

* Double the dosage if used in wooden bins.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Wheat (con.)						
In bulk, in concrete or metal bins, farm-type metal bins, or large steel tanks (con.) Beetles and moths	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F	3 gal./1,000 bu. *	Gravity distribution fumigation. Above 70° F.	Fumigants should be applied only by a trained operator.
				4 gal./1,000 bu. *	Gravity distribution fumigation. 50°- 69° F.	
				2.5 gal.	Forced distribution fumigation. Closed recirculation and single-pass. Above 70° F.	Aerate after fumigation with methyl bromide.
				3.5 gal.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 69° F.	
	Hydrogen cyanide	100	F	3 lb.	Forced distribution fumigation. Closed recirculation and single-pass.	
	Methyl bromide	50 (inorganic bromide)	F	2 lb.	Forced distribution fumigation. Closed recirculation and single-pass. Above 60° F.	
				3 lb.	Forced distribution fumigation. Closed recirculation and single-pass. 50°- 59° F.	
In bulk, in concrete or metal bins Beetles and moths	Ethylene dibromide + methyl bromide (30:70 mixture)	50 (inorganic bromide) Exempt (organic bromide)	F	1.125 - 1.5 lb.	Above 70° F.	
				2 - 3 lb.	50°- 69° F.	
	Ethylene dibromide + methyl bromide (70:30 mixture)	50 (inorganic bromide) Exempt (organic bromide)	F	30 oz./1,000 bu.	Probe fumigant into hotspot.	

* Double the dosage if used in wooden bins.

STORED-PRODUCT INSECTS

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Wheat (con.)						
In bulk Beetles and moths	Malathion	8	EC (premium grade)	0.63 lb./1,000 bu.	Mix with water 3 - 5 gal./1,000 bu. Spray on grain stream as it goes into storage.	Fumigants should be applied only by a trained operator.
				0.02 lb./100 sq. ft. of surface area.	Surface spray. Will not control insects already established beneath the surface.	
			D	0.6 lb./1,000 bu.	Mix dust into wheat at harvesttime.	
	Pyrethrins + piperonyl butoxide	3 + 20 *	EC or oil soln.	0.06 + 0.6 lb./ 1,000 bu.	Mix with water, 3 - 5 gal./1,000 bu. Apply as protective spray to grain before it is stored.	
			D	0.06 + 0.83 lb./ 1,000 bu.	Mix dust into wheat at harvesttime.	
Moths	Chloropicrin	Exempt	F	1.5 lb./1,000 cu. ft. of space above grain.	Apply as fine spray or vapor into space over top of grain to control moths in surface layer. Above 70° F.	
				2 lb./1,000 cu. ft. of space above grain.	Apply as fine spray or vapor into space over top of grain to control moths in surface layer. 50°- 69° F.	
In bulk or in bags Flying insects	Pyrethrins + piperonyl butoxide	3 + 20 *	Oil soln. % by wt. Pyrethrins 0.2 + piperonyl butoxide 2.0 + tetrachloro-ethylene 50.0 + deodorized kerosene 47.8	0.006 + 0.06 lb./ 10,000 cu. ft. of airspace.	Apply with thermal aerosol generator.	

* Tolerance for pyrethrins and piperonyl butoxide on oats is 1 + 8 p.p.m.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Wheat (con.)						
In flat storage Beetles and moths	Aluminum phosphide	No-residue basis	F	3 tablets/ton or 90 tablets/1,000 bu.	Place tablets in grain mass. Fumigate at 70° F. or above for 3 days.	Fumigants should be applied only by a trained operator.
	Calcium cyanide	25 (hydrogen cyanide)	F	15 - 20 lb./1,000 bu.	Mix into grain.	Manufacturers of aluminum phosphide tablets insists his representative train all first users.
	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt	F	4 gal./1,000 bu.	Gravity distribution fumigation. Above 70° F.	Do not fumigate with aluminum phosphide when temperature remains below 40° F.
				5 gal./1,000 bu.	Gravity distribution fumigation. 50°- 69° F.	
				1.5 gal.	Forced distribution fumigation. Above 60° F.	Do not recirculate aluminum phosphide.
				2 gal.	Forced distribution fumigation. 50°- 59° F.	
	Chloroform + carbon disulfide + ethylene dibromide (71.25: 23.75: 5.0 mixture)	50 (inorganic bromide) Others exempt	F	1.5 gal./1,000 bu.	Above 70° F.	
				2.5 gal./1,000 bu.	50°- 69° F.	
	Chloropicrin + methyl chloride (85:15 mixture)	Exempt	F	2 lb.	Forced distribution fumigation. Above 70° F.	
				3 lb.	Forced distribution fumigation. 50° - 69° F.	
	Ethylene dibromide + ethylene dichloride + carbon tetrachloride (5: 35: 60 mixture)	50 (inorganic bromide) Others exempt	F	3 gal./1,000 bu.	Gravity distribution fumigation. Above 70° F.	

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Wheat (con.)						
In flat storage(con.) Beetles and moths	Ethylene dibromide + methyl bromide (30:70 mixture)	50 (inorganic bromide) Exempt (organic bromide)	F	1.125 - 1.5 lb.	Forced distribution fumigation. Above 70° F.	Fumigants should be applied only by a trained operator.
				2 - 3 lb.	Forced distribution fumigation. 50°- 69° F.	Aerate after fumigation with methyl bromide.
	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F	6 gal./1,000 bu.	Gravity distribution fumigation. Above 70° F.	
				7 gal./1,000 bu.	Gravity distribution fumigation. 50°- 69° F.	
				2.5 gal.	Forced distribution fumigation. Above 70° F.	
				3.5 gal.	Forced distribution fumigation. 50°- 69° F.	
	Hydrogen cyanide	100	F	3 lb.	Forced distribution fumigation. Recirculation or single-pass.	
	Methyl bromide	50 (inorganic bromide)	F	2 lb.	Forced distribution fumigation. Recirculation and single-pass. Above 60° F.	
				3 lb.	Forced distribution fumigation. Recirculation and single-pass. 50°- 59° F.	
In bulk, in freight cars and van trucks Beetles and moths	Chloropicrin	Exempt	F	2 lb.	Recirculation fumigation. Above 70° F.	
				3 lb.	Recirculation fumigation. 50°- 69° F.	

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Wheat (con.)						
In bulk, in freight cars and van trucks (con.) Beetles and moths	Hydrogen cyanide	100	F	2 lb.	Recirculation fumigation. Above 70° F.	Fumigants should be applied only by a trained operator.
				3 lb.	Recirculation fumigation. 50°- 69° F.	
	Methyl bromide	50 (inorganic bromide)	F	2 lb.	Recirculation fumigation. Above 70° F.	Aerate after fumigation with methyl bromide, chloropicrin and hydrogen cyanide.
				3 lb.	Recirculation fumigation. 50°- 69° F.	
	Ethylene dibromide + ethylene dichloride + carbon tetrachloride (5: 35: 60 mixture)	50 (inorganic bromide) Others exempt	F	5 gal./car	Apply from outside of car using hand or power sprayer.	
In bags in warehouse Beetles and moths	Chloropicrin + methyl chloride (85:15 mixture)	Exempt	F	2 lb.	Space fumigation. Above 70° F.	
				4 lb.	Space fumigation. 50°- 69° F.	
	Hydrogen cyanide	100	F	3 lb.	Space fumigation.	
	Methyl bromide	50 (inorganic bromide)	F	2 lb.	Space fumigation. Above 60° F.	
				4 lb.	Space fumigation. 50°- 59° F.	
Elevator machinery Beetles and moths	Ethylene dibromide + methyl bromide (70:30 mixture)	50 (inorganic bromide) Exempt (organic bromide)	F	1.5 - 2 oz./boot or leg.	Apply as often as necessary to prevent infestation from becoming established.	

Continued

STORED-PRODUCT INSECTS

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GRAIN--Wheat (con.)						
Elevator machinery (con.) Beetles and moths	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt	F	1.5 pt. in small boots.	Apply as often as necessary to prevent infestation from becoming established.	Fumigants should be applied only by a trained operator.
				0.5 gal. in large boots.		
				4 oz./ft. in screw conveyors.		
Storage bin or ship's hold Beetles and moths	Allethrin	2 on grain	EC	0.08 lb./1,000 sq. ft.	Mix with water. At least 2 - 4 weeks before grain is binned, spray inside walls and floor of bin at rate of 2 gal./ 1,000 sq. ft.	
	Malathion	8 on grain	EC (premium grade)	0.45 lb./1,000 sq. ft.		
	Methoxychlor	2 on grain	WP, EC	0.4 lb./1,000 sq. ft.		
	Pyrethrins + piperonyl butoxide	3 + 20 *	Soln.	0.013 lb./1,000 sq. ft.	Mix with water and apply to walls and floor of empty storage at the rate of 2 gal./1,000 sq. ft.	
Tunnels, gallery floor, and head house of grain elevator Beetles and moths	Allethrin, 0.5%	2	EC	0.4 lb./1,000 sq. ft.	Apply as residual spray about 3 times during the summer.	
	Methoxychlor	2	EC or WP			
	Pyrethrins, 0.5% + piperonyl butoxide	3 + 20 *	EC			

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
GUMS						
In storage Beetles and moths	Propylene oxide	300 (propylene oxide)	F	--	Follow manufacturer's directions on label.	Fumigants should be applied only by a trained operator.
MEAT--Home cured						
Storeroom Cheese skipper (Piophila casei), larder beetle (Dermestes lardarius, red-legged ham beetle (Necrobia rufipes, and mites	Sanitation	--	--	--	Sweep storeroom and scrub with hot soapy water to remove grease. Seal cracks with putty or plastic wood.	Do not apply insecticide directly on meats or where the meat will come in contact with it. If meat has been removed from storeroom before treatment, do not return it until spray has dried.
Cheese skipper (Piophila casei), larder beetle (Dermestes lardarius, and red-legged ham beetle (Necrobia rufipes	DDT	0	1 lb. 50% WP per 2.5 gal. water	To point of runoff.	Apply as coarse spray every 3 months to all places where insects might hide or crawl. Keep spray material well stirred. Insecticide can be applied with paintbrush if room is stocked with meat.	
	Methoxychlor	0	1 lb. 50% WP per 2.5 gal. water	To point of runoff.		
Mites	Pyrethrins + piperonyl butoxide	0	Oil soln. (pyrethrins 0.2% + piperonyl butoxide 2.0%)	To point of runoff.	Apply as coarse spray every 30 or 45 days if mites are a continuing problem. Insecticide can be applied with paintbrush if room is stocked with meat.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
MEAT--Home cured (con.)						
Storeroom, in transit, or home Any insects	Cold storage	--	--	45° F. or below.	Keep meat cold. It can be frozen.	Fumigants should be applied only by a trained operator.
MEATS-- Cured ham, bacon, and sausage						
Storeroom Cheese skipper (Piophila casei), larder beetle Dermestes lardarius), red-legged ham beetle (Necrobia rufipes), and mites	Hydrogen cyanide	50	F	2 lb.	Expose for 12 hr. in gastight room.	Aerate for 24 hr. after fumigation with hydrogen cyanide.
MEAT--Ham						
In farm storage Cheese skipper (Piophila casei)	Embedding in grain or cottonseed hulls	--	--	--	Bury meat in grain several inches from surface or sides.	
	Wrapping and hanging	--	--	--	Wrap pieces of meat separately in heavy wrapping paper. Enclose in cloth sack. Tie sack and hang pieces so they do not touch and rodents cannot reach them. Change paper wrapper if it gets greasy.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
NUTS--Almond, brazil nut, bush nut (macadamia nut), butternut, cashew nut, chestnut, filbert (hazelnut), hickory nut, pecan, pistachio nut, walnut.						
In bulk Beetles and moths	Methyl bromide	200 (inorganic bromide on nuts after shells have been removed and discarded.)	F	3.5 lb.	Expose for 24 hr. in atmospheric chamber.	Fumigants should be applied only by a trained operator. Aerate nuts for 24 hours after fumigation.
NUTS--Almond, cashew, walnut, pecan						
In bulk Beetles and moths	Hydrogen cyanide	25	F	3.0 lb.	Expose for 12 hr. in atmospheric chamber.	
NUTS--Almond, walnut						
In bulk Beetles and moths	Pyrethrins + piperonyl butoxide	1 + 8	EC or WP	0.013 + 0.13 lb.	Mix with water and apply to empty bins at rate of 2 gal./1,000 sq. ft.	
			EC	0.2 + 2.0 lb./ 5 gal. water/15 tons.	Apply spray uniformly to nuts as they travel on conveyor to bin, warehouse, or bagging machine. Use power equipment to deliver coarse, wet spray.	
			WP	0.17 + 1.7 lb./ 5 gal. water/15 tons		

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
NUTS--Peanut, walnut, pecan, almond, filbert, chestnut,and imported cashew and brazil nut						
In bulk Beetles and moths	Cold storage	--	--	36° F. or below and 65 - 75% relative humidity.	Storage life is about 1 year for shelled and two years for unshelled nuts.	
				48° F. or below and 65 - 75% relative humidity.	Storage life is 6 - 9 months for shelled and 1 - 1.5 years for unshelled nuts.	
NUTS--Black walnut meat						
In packages Beetles and moths	Ethylene oxide	50	F	3 lb.	Expose for 24 hr.	Fumigants should be applied only by a trained operator

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
NUTS--Farmers stock peanuts						
In warehouse, in bulk, or in bags Beetles and moths	Malathion	8 (on shelled peanuts)	WP (premium grade)	0.44 lb. in 2 gal. water/1,000 sq. ft.	Apply as surface spray over top of bulk stored peanuts or to outside surface of stacked bagged peanuts. Use power equipment to deliver coarse, wet spray. Make first application when bin is filled or stack of bagged peanuts completed. Level top of piles on bulk peanuts to eliminate peaks. Southeast: First application, not later than Oct. 1; second, 1 month later. Southwest: First application when bin is filled or stack completed; second, about March 1. Virginia: First application, when bin is filled or stack completed; second about April 1. All areas: Make application each 2 months after second treatment.	
			EC (premium grade)	1.6 lb./5 gal. water/15 tons peanuts.	Apply spray uniformly to peanuts as they travel on conveyor to bin, warehouse, or bagging machine. Use power equipment to deliver a coarse, wet spray.	

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
NUTS--Farmers stock peanuts (con.)						
In warehouse, in bulk, or in bags (con.) Beetles and moths	Pyrethrins + piperonyl butoxide	1 + 8 (on shelled peanuts)	WP	0.01 + 0.10 lb. in 2 gal. water/1,000 sq. ft.	Apply as surface spray over top of bulk stored peanuts or to outside surface of stacked bagged peanuts. Use power equipment to deliver coarse wet spray. Double the rate for first and second application. Southeast: First application, when bin is filled or stack of bags is completed, but not later than Oct. 1. Treat at 7-day intervals through Nov., and at 15-day intervals thereafter. Virginia: First application April 1, treat at 7-day intervals through April, and every 15 days thereafter. Southwest: South of Waco, Texas. First application about Mar. 1, then treat at 7-day intervals through Mar., and each 15 days thereafter. North of Waco, Texas: Same sequence as Southwest, 1 month later.	A good grade of petroleum distillate must be used in formulating the oil solution of pyrethrins and piperonyl butoxide. Otherwise tainting of the peanuts may result.
			Oil soln.	0.02 + 0.20 lb./ 1,000 sq. ft.		
			Oil soln. % by wt. Pyrethrins 0.2 + piperonyl butoxide 2.0 + tetrachloro-ethylene 50.0 + deodorized kerosene 47.8	0.006 + 0.06 lb./ 10,000 cu. ft. of airspace over the load.	Apply with thermal aerosol generator. Use as supplement to surface sprays when a persistent insect infestation develops. First application, right after peanuts come into warehouse; second application, 1 week later. After that, apply every 2 weeks until the middle of November.	Do not release aerosol near open flames.

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COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
NUTS--Farmers stock peanuts (con.)						
In warehouse, in bulk, or in bags (con.) Beetles and moths	Pyrethrins + piperonyl butoxide	1 + 8	Oil soln. % by wt. Pyrethrins 0.5 + piperonyl butoxide 5.0 + tetrachloroethylene 50.0 + deodorized kerosene 44.5	0.006 + 0.06 lb./ 10,000 cu. ft. of airspace over the load.	Apply with mechanical aerosol generator or as a mist spray. Use as supplement to surface sprays when a persistent insect infestation develops. First application, right after peanuts come into warehouse; second application, 1 week later. After that, apply every 2 weeks until the middle of November.	Fumigants should be applied only by a trained operator. Do not release aerosols near open flames. Determine residue level before a third fumigation with methyl bromide to avoid exceeding tolerance. Before a third fumigation, treat trial lot to test for off-odor or flavor.
			EC	0.2 + 2.0 lb./ 5 gal. water/15 tons peanuts	Apply spray uniformly to peanuts as they travel on conveyor to bin, warehouse, or bagging machine. Use power equipment to deliver a coarse, wet spray.	
			WP	0.17 + 1.7 lb./ 5 gal. water/15 tons peanuts		
In silos and warehouses Beetles and moths	Hydrogen cyanide	25	F	1 - 2 lb.	Fumigate peanuts for 24 hr. in warehouse when no protective treatments have been applied or if the peanuts are heavily infested. Warehouse must be tightly constructed or be sealed. In silos the fumigants should be recirculated.	
	Methyl bromide	200 (inorganic bromide)	F	1 - 2 lb.		
NUTS--Shelled peanuts						
In bags in warehouses and atmospheric fumigation chambers. Beetles and moths	Methyl bromide	200 (inorganic bromide)	F	1.5 lb.	Fumigate for 24 hr. at 60° F. or above. Structure must be tightly constructed and properly sealed.	

STORED-PRODUCT INSECTS

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
NUTS--Shelled peanuts (con.)						
In bags under tarpaulins Beetles and moths	Methyl bromide	200 (inorganic bromide)	F	2 lb.	Fumigate for 24 hr. at 60° F. or above.	Fumigants should be applied only by a trained operator.
In vacuum chambers Beetles and moths			F	2.5 lb.	Fumigate for 3 hr. at 55° F. or above with vacuum sustained at 28" or better during exposure period.	Aerate after fumigation. Determine residue level before a third fumigation with methyl bromide.
In bags in freight cars or truck vans Beetles and moths			F	10 lb./50-foot steel car.	Fumigate for 24 hr. at 60° F. or above. Should not be moved before end of exposure period. In wooden freight cars increase rate 2 - 4 lb. per car.	
				8 lb./40-foot steel car.		
				5 lb./truck.		
PEANUT WAREHOUSES						
Empty, before peanuts are brought in Beetles and moths	Malathion	8 (on shelled peanuts)	3% EC or WP (premium grade)	0.45 lb./1,000 sq. ft.	Apply as a residual spray 1 or 2 weeks before any peanuts are brought in. Clean warehouse thoroughly and burn, bury, or remove all peanut scraps and refuse that might harbor insects. Spray floors, walls, beams, and ceiling inside warehouse. Spray outside walls to height of 6 to 8 ft. Spray ground to about 6 ft. from building.	
	Methoxychlor	--	EC or WP	0.4 lb./1,000 sq. ft.		

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
PACKAGED FOOD						
In warehouses Beetles and moths	Pyrethrins + piperonyl butoxide	3 + 20	Oil soln. % by wt. Pyrethrins 0.2 + piperonyl butoxide 2.0 + tetrachloroethylene 50.0 + deodorized kerosene 47.8	0.006 + 0.06 lb./ 10,000 cu. ft. of airspace.	Apply with thermal aerosol generator. Apply after working hours in afternoon and leave warehouse closed overnight. Preventive treatment only; will not control insects inside packages.	Do not release aerosol near open flames.
			Pyrethrins 0.5 + piperonyl butoxide 5.0 + tetrachloroethylene 50.0 + deodorized kerosene 44.5	0.006 + 0.06 lb./ 10,000 cu. ft. of airspace.	Apply with mechanical aerosol generator. Apply after working hours in afternoon and leave warehouse closed overnight. Preventive treatment only; will not control insects inside packages.	
Machinery in processing plant and packaging plants Beetles and moths	Carbon tetrachloride + ethylene dichloride + ethylene dibromide (21: 64: 15 mixture)	50 (inorganic bromide) Others exempt	F	0.5 - 1.5 pt. in area to be treated.	Spot fumigation of machinery every 2 weeks. Spot fumigations keep the insect population at a low level, but do not destroy all infestation in a plant. General fumigation is sometimes necessary.	Fumigants should be applied only by a trained operator.
	Ethylene dibromide + methyl bromide (70:30 mixture)					
	Ethylene dichloride + carbon tetrachloride (75:25 mixture)					

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
PACKAGED FOOD (con.)						
In home pantry Beetles and moths	Chlordane		S* (2%)	To point of runoff.	Spray walls and shelves of cupboard to point of runoff of solution. After spray has dried, place paper on shelves before returning food and utensils to cupboard. Repeat after 6 months or as required.	Remove food and utensils from shelves before applying spray.
	DDT		S* (5%)			
	Lindane		S* (0.5%)			
	Malathion		S* (2% premium grade)			
	Freezing			0° F.	Place packages in home freezer for 4 days. Repackage food in tightly sealed glass jars.	
	Heating	--	--	120° - 140° F.	Remove food from packages and heat in oven for 0.5 hr. Repackage food in tightly sealed glass jars.	
PACKAGED FOOD- Macaroni and noodles						
In packages Beetles and moths	Aluminum phosphide	0.1	F	45 - 60 tablets	5 days at 54° to 59° F.	Manufacturer of aluminum phosphide insists his representative train all first users. Aerate products 48 hours before offering to consumers. Do not fumigate when temperature remains below 40° F.
					4 days at 60° to 68° F.	
					3 days or more at above 68° F.	
				165 - 200 pellets	4 days at 54° to 59° F.	
					3 days at 60° to 68° F.	
					2 days or more at above 68° F.	

* Some formulations may be purchased ready to use; others must be prepared by diluting premium-grade emulsifiable concentrates or wettable powders.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
PEAS						
In 100-lb. bags Weevils	Hydrogen cyanide	25	F	1.5 lb.	24 hr. in warehouse.	Fumigants should be applied only by a trained operator. Do not fumigate with hydrogen cyanide at temperatures below 60° F. Aerate for 24 hours after treatment.
				2 lb.	12 hr. in warehouse.	
				1.5 lb.	12 - 24 hr. in atmospheric chamber.	
				1.5 lb.	12 - 24 hr. under tarpaulin.	
	Methyl bromide	50 (inorganic bromide)	F	1.5 lb.	24 hr. at 60° F. or above in atmospheric vault.	
				3 lb.	24 hr. at 59° F. or below in atmospheric vault.	
				2 lb.	24 hr. at 60° F. or above under tarpaulin.	
				3 lb.	24 hr. at 59° F. or below under tarpaulin.	
				3 lb.	24 hr. at 60° F. or above in freight cars.	
				4 lb.	24 hr. at 59° F. or below in freight cars.	
				2 lb.	24 hr. at 60° F. or above in warehouse.	
				3 lb.	24 hr. at 59° F. or below in warehouse.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
PEAS (con.)						
In packages in home Beetles and moths	Freezing	--	--	--	Soon after harvest, put beans in home freezer at 0° F. for 4 days. Store in insect-proof container such as glass jar.	
	Heating	--	--	--	Heat to 120° F. in oven and hold for 0.5 hour. Store in insect-proof container such as glass jar.	
POTATO						
In bulk Potato tuberworm (Phthorimaea operculella)	Methyl bromide	75 (inorganic bromide)	F	3.5 lb. 3.0 lb.	Fumigate in atmospheric chamber. 2 hours at 60° F. 2 hours above 60° F.	Fumigants should be applied only by a trained operator.
				2.5 lb.	1.5 hr. above 70° F. in vacuum chamber.	After fumigation, aerate potatoes promptly to avoid injury.

STORED-PRODUCT INSECTS

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
POTATO--For seed						
In bags Potato tuberworm (Phthorimaea operculella)	DDT	--	D	0.006 lb./100 lb. of bags	Dip or spray bags.	Use DDT on seed potatoes only; not on potatoes to be used for food or feed.
Storage area Potato tuberworm (Phthorimaea operculella)	DDT	--	D	0.1 lb./1,000 sq. ft.	Empty, clean, and treat area just before potatoes are stored.	
			WP	0.06 lb./1,000 sq. ft.		
SEEDS						
In bulk Beetles and moths	Diatomaceous earths	*	D	7 lb./ton	Insecticidal dust mixed with seed as a protectant. Treat before placing seed in storage.	Do not use for food or feed, except those seeds for which an exemption or tolerance has been established. Use proper respirator when applying dust.
	Malathion	--	D (premium grade)	2 oz./bu.		
			EC (premium grade)	0.63 lb./1,000 bu.	Spray formulation on the seeds before they are stored.	
	Methoxychlor	--	D	2 oz./bu.	Insecticidal dust mixed with seed as a protectant. Treat before placing seed in storage.	
	Pyrethrins + piperonyl butoxide	--	D	0.006 + 0.06 oz./bu.		
			EC	0.06 + 0.6 lb./1,000 bu.	Spray formulation on the seeds before they are stored.	

Continued

* Exempt from tolerance on beans, peas, soybeans, barley, buckwheat, corn, oats, rice, rye, sorghum, and wheat.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
SEEDS (con.)						
In bulk (con.) Beetles and moths	Cold storage	--	--	Between 40 and 50° F.	Hold the seeds in cold storage to discourage insects. Seeds must be very dry. Use them promptly after taking them out of cold storage.	Fumigants should be applied only by a trained operator.
	Heating	--	--	140° F. for 10 min.	Heat the seeds uniformly. If seed is high in moisture content, germination may be impaired.	Do not use fumigated seeds for feed.
In bags in warehouses Beetles and moths	Aluminum phosphide	No-residue basis	F	90 tablets/1,000 bu.	3 days at 70° F. and above.	Manufacturer of aluminum phosphide tablets insists his representative train all first users.
	Carbon tetrachloride + carbon disulfide (80:20 mixture)	Exempt Exempt	F	2.5 gal.	24 hr. at 70° F. and above.	Do not use hydrogen cyanide to fumigate seed containing more than 14% moisture. Generally, refumigation does not affect germination.
	Ethylene dichloride + carbon tetrachloride (75:25 mixture)	Exempt Exempt	F	4 gal.	24 hr. at 70° F. and above.	
	Hydrogen cyanide	100	F	2.5 lb.	24 hr. at 50° - 65° F. under atmospheric pressure.	
				2 lb.	24 hr. at 66° F. and above under atmospheric pressure.	
				2.5 lb.	3 hr. in vacuum chamber at 70° F. and above.	

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
SEEDS (con.)						
In bags in warehouses (con.) Beetles and moths	Methyl bromide	50	F	1.5 lb.	24 hr. 50° - 65° F. under atmospheric pressure.	Fumigants should be applied only by a trained operator.
				1 lb.	24 hr. 60° F. and above under atmospheric pressure.	
				2.5 lb.	3 hr. in vacuum chamber at 70° F. and above.	Do not use methyl bromide to fumigate seed containing more than 12% moisture. Avoid repeated fumigation. Aerate completely after fumigation.
Moths	Pyrethrins + piperonyl butoxide	--	Oil soln. % by wt. Pyrethrins 0.5 + piperonyl butoxide 5.0 + tetrachloroethylene 50.0 + deodorized kerosene 44.5	0.006 + 0.06 lb./ 10,000 cu. ft. of airspace over the load.	Apply with mechanical aerosol generator, or as a mist spray every 2 weeks.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
SPICES-- Allspice, anise, basil, bay, black pepper, caraway, cassia, celery seed, chili, cinnamon, cloves, coriander, cumin, dill, ginger, mace, marjoram, nutmeg, oregano, paprika, poppy, red pepper, rosemary, sage, savory, thyme, turmeric, white pepper.						
In packages Beetles and moths	Hydrogen cyanide	250	F	1.5 lb.	Fumigate for 12 hr. in atmospheric chamber.	Fumigants should be applied only by a trained operator. Aerate for 24 to 72 hr. after fumigation.
SPICES--Black pepper						
In bags Beetles and moths	Bag liner	--	--	--	Store and ship whole pepper in double burlap bags with polyethylene liners 3 mils or more in thickness.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
SPICES--Ground						
In packages Beetles and moths	Aluminum phosphide	0.1	F	45 - 60 tablets	5 days at 54° to 59° F.	Fumigants should be applied only by a trained operator.
					4 days at 60° to 68° F.	
					3 days or more above 68° F.	Manufacturer of aluminum phosphide insists his representative train all first users. Aerate products 48 hours before offering to consumer.
				165 - 200 pellets	4 days at 54° to 59° F.	
					3 days at 60° to 68° F.	
					2 days or more at above 68° F.	
SPICES--Whole						Do not fumigate with aluminum phosphide when temperature remains below 40° F.
In bags Beetles and moths	Ethylene oxide	50	F	0.21 lb./100 lb.	Fumigate for 24 hours.	
	Propylene oxide	300 (propylene oxide)	F	--	Follow manufacturer's directions on label.	Aerate for 24 to 72 hr. after fumigation with ethylene oxide or propylene oxide.
STARCH						
In storage Beetles and moths	Propylene oxide	300 (propylene oxide)	F	--	Follow manufacturer's directions on label.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
SWEETPOTATO Storage area Sweetpotato weevil (Cylas formicarius elegantulus)	DDT	7	D	0.1 lb. dust/1,000 sq. ft.	Empty, clean, and treat area where potatoes are to be stored.	Do not feed DDT-treated sweetpotatoes to dairy animals or animals being finished for slaughter. Sweetpotatoes must be washed thoroughly before they are eaten or offered for sale.
			WP	0.06 lb. in spray/ 1,000 sq. ft.		
SWEETPOTATO--For seed In bulk Sweetpotato weevil (Cylas formicarius elegantulus)	DDT	7	D	0.1 lb./6 - 8 bu.	Dust DDT on sweetpotatoes.	
TOBACCO In hogsheads in warehouses Tobacco moth (Ephestia elutella)	Dichlorvos	--	Dichlorvos + highly refined deodorized kerosene + solvent	1 g.	Apply as an aerosol once a week.	Do not apply dichlorvos on concrete, which neutralizes its effect.
Cigarette beetle (Lasioderma serricorne)	Dichlorvos	--	Dichlorvos + highly refined deodorized kerosene + solvent	2 g.	Apply as an aerosol twice a week.	
			20% dichlorvos + 1% inhibitor + equal parts of Freon 11 and 12	0.5 g.	Apply as an aerosol daily.	

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
TOBACCO (con.)						
In hogsheads in warehouses (con.) Tobacco moth (Ephestia elutella) and cigarette beetle (Lasioderma serricorne)	Screening	--	--	Screens should be 20-mesh, made of wire 0.135 in. in diameter, or 18-mesh wire 0.02 in. in diameter. Openings between wires should be less than 0.0396 in.	Cover openings such as louvers, doors, windows, and ventilators with screen wire.	Do not drip insecticide on tobacco.
In warehouses, in redrying plants, and in packhouses Tobacco moth (Ephestia elutella) Cigarette beetle (Lasioderma serricorne)	Pyrethrins	--	Pyrethrins 0.2% in highly refined deodorized kerosene	3 fluid oz. of formulations.	Apply aerosol with mechanical or thermal generator weekly or more often, between 4 p.m. and midnight.	
	Pyrethrins + piperonyl butoxide	--	Pyrethrins 0.2% + piperonyl butoxide 2.0% in highly refined deodorized kerosene			
	Pyrethrins	--	Pyrethrins 1% in highly refined deodorized kerosene			
	Pyrethrins + piperonyl butoxide	--	Pyrethrins 1% + piperonyl butoxide 10% in highly refined deodorized kerosene			
In packhouses and curing sheds Cigarette beetle (Lasioderma serricorne) Tobacco moth (Ephestia elutella)	Dichlorvos	--	Dichlorvos 2.97% in aerosol.	0.5 to 1.0 gm. weekly, or as often as necessary.	Release aerosol in center of area of infestation between 5 and 12 p.m.	Do not enter treated area within 4 hours after application.

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
TOBACCO (con.)						
In drying sheds and packhouses Tobacco moth (Ephestia elutella)	DDT	--	WP	0.8 lb./1,000 sq. ft.	Apply to walls and ceiling early in spring after thorough cleanup.	
In factory Cigarette beetle (Lasioderma serricorne) and tobacco moth (Ephestia elutella)	Air screens	--	--	--	Mount electric fan to blow through door of receiving room whenever the door is open, to hinder flight of insects into factory.	
	Dichlorvos	--	Dichlorvos 20% + inhibitor 1% in 1 + 1 mixture of Freon 11 and 12	0.5 g.	Automatic aerosol dispensing system releases set amount of aerosol at set hour each night after work hours.	
	Heat in high vacuum	--	--	140° F. for 12 - 14 min.	Heat chamber where continuous vapor is passed across tobacco being treated.	
				160°- 180° F. for 15 min.	Heat chamber - "Guardite" type.	
Redrying plant Cigarette beetle (Lasioderma serricorne) and tobacco moth (Ephestia elutella)	Sanitation program	--	--	--	Before and after use of redrying plant, clean, brush, sweep, and vacuum entire plant thoroughly. When plant is in operation, hogsheads of tobacco remnants should be covered and kept in a screened room.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
TOBACCO-- Raw or manufactured						
In storage Cigarette beetle (Lasioderma serricorne)	Cold storage	--	--	-10° F. for 4 - 5 days.	Insects are inactive at low temperatures, and all stages eventually die.	Fumigants should be applied only by a trained operator.
				10° F. for 8.5 days or more.		
				36° F. for 16 days.		
				47°- 48° F. for 4 months.		
				50°- 60° F. for entire storage period.		
TOBACCO-- Flue-cured, Turkish, and cigar filler or binder						
In hogsheads, bales, or cases Cigarette beetle (Lasioderma serricorne) and tobacco moth (Ephestia elutella)	Acrylonitrile + carbon tetrachloride (33:67 mixture)	--	F	3.5 – 4 lb.	72 hr. at 70° F. or above in warehouse or under tarpaulins.	
	Hydrogen cyanide	--	F	1 - 1.5 lb.	72 hr. at 70° F. or above in warehouse or under tarpaulins.	
					72 hr. at 70° F. or above in atmospheric chamber.	

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
TOBACCO-- Flue-cured, Turkish, and cigar filler or binder (con.)						
In hogsheads, bales, or cases (con.) Cigarette beetle (Lasioderma serricorne) and tobacco moth (Ephestia elutella)	Methyl bromide	--	F	1.5 lb.	72 hr. at 70° F. or above in warehouse or under tarpaulins.	Fumigants should be applied only by a trained operator.
					72 hr. at 70° F. or above in atmospheric chamber.	
TOBACCO-- Flue-cured						
In hogsheads Cigarette beetle (Lasioderma serricorne) and tobacco moth (Ephestia elutella)	Acrylonitrile + carbon tetrachloride (33:67 mixture)	--	F	4 lb.	4 hr. at above 70° F. in vacuum chamber.	
				5 lb.	4 hr. at 35°- 69° F. in vacuum chamber.	
				2 - 3 lb.	72 hr. at 70° or above in atmospheric chamber.	
	Hydrogen cyanide	--	F	4 lb.	4 hr. at above 70° F. in vacuum chamber.	
				5 lb.	4 hr. at 35° - 69° F. in vacuum chamber.	

Continued

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
TOBACCO-- Flue-cured (con.)						
In hogsheads (con.) Cigarette beetle (Lasioderma serricorne) and tobacco moth (Ephestia elutella)	Methyl bromide	--	F	4 lb.	4 hr. at above 70° F. in vacuum chamber.	Fumigants should be applied only by a trained operator.
				5 lb.	4 hr. at 35° - 69° F. in vacuum chamber.	
TOBACCO-- Turkish or cigar filler or binder						
In bales or cases Cigarette beetle (Lasioderma serricorne) and tobacco moth (Ephestia elutella)	Acrylonitrile + carbon tetrachloride (33:67 mixture)	--	F	2 lb.	48 hr. at 70° F. or above in atmospheric chamber.	
				4 lb.	4 hr. at above 70° F. in vacuum chamber.	
				5 to 6 lb.	4 hr. at 35°- 69° F. in vacuum chamber.	
	Hydrogen cyanide	--	F	4 lb.	4 hr. at above 70° F. in vacuum chamber.	
				5 lb.	4 hr. at 35°- 69° F. in vacuum chamber.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
TOBACCO-- Cigar binder and filler						Fumigants should be applied only by a trained operator.
In bales or cases Cigarette beetle (Lasioderma serricorne), and tobacco moth (Ephestia elutella)	Hydrogen cyanide	--	F	4 lb.	4 hr. at above 70° F. in vacuum chamber.	
				5 lb.	4 hr. at 35°- 69° F. in vacuum chamber.	
	Methyl bromide	--	F	4 lb.	4 hr. at above 70° F. in vacuum chamber.	
TOBACCO-- Cigar wrapper						
In bales Cigarette beetle (Lasioderma serricorne), and tobacco moth (Ephestia elutella)	Acrylonitrile + carbon tetrachloride (33:67 mixture)	--	F	4 lb.	4 hr. at above 70° F. in vacuum chamber.	
				5 lb.	4 hr. at 35°- 69° F. in vacuum chamber.	
	Ethylene oxide + carbon dioxide (10:90 mixture)	--	F	65 lb.	4 hr. at above 70° F. in vacuum chamber.	
	Hydrogen cyanide	--	F	5 lb.	4 hr. at above 70° F. in vacuum chamber.	
	Methyl bromide	--	F	4 lb.	4 hours above 70° F. in vacuum chamber.	

COMMODITY, STORAGE, AND INSECT	INSECTICIDE OR TREATMENT	TOLERANCE *(p. p. m.)*	FORMULATION	DOSAGE *(active ingredient per 1,000 cu. ft. unless otherwise stated)*	HOW, WHERE, AND WHEN TO APPLY	SAFETY RESTRICTIONS
TOBACCO-- Cigars						
In boxes Cigarette beetle (Lasioderma serricorne), and tobacco moth (Ephestia elutella)	Acrylonitrile + carbon tetrachloride (33:67 mixture)	--	F	4 lb.	4 hr. at above 70° F. in vacuum chamber.	Fumigants should be applied only by a trained operator.
	Ethylene oxide + carbon dioxide (10:90 mixture)	--	F	45 lb.	4 hr. at above 70° F. in vacuum chamber.	
WOOLENS (See FABRICS--Woolens)						

HOST AND INSECT	INSECTICIDE	FORMULATION AND POUNDS OF ACTIVE INGREDIENT PER 100 GALLONS	RATE OF APPLICATION OF FORMULATION	METHOD OF TREATMENT	SAFETY RESTRICTIONS
LOGS AND PULPWOOD					
Ambrosia beetles and wood borers	Benzene hexachloride	Soln. in No. 2 fuel oil, 4	At least 1 gal./100 sq. ft. bark surface.	Apply immediately after cutting, within 24 hours if possible. Wet thoroughly with coarse spray. Protects wood in warm weather storage.	Operators should wear rubber gloves and a rubber apron. Set spray nozzles coarse enough to avoid atomizing the solution.
Bark beetles	Benzene hexachloride	Emulsion, 2			
UNSEASONED LUMBER					
Ambrosia beetles	Benzene hexachloride	Emulsion, 10 oz. gamma isomer	Approximately 15 gal./M bd. ft.	10 second dip. Combine with sap stain dip on green chain.	
SEASONED LUMBER, FINISHED WOOD PRODUCTS, AND BUILDINGS					
Powder-post beetles	DDT	Soln. in light oil, 40	At least 1 gal./100 sq. ft. for each of one or more applications.	Dip for 10 seconds or thoroughly brush or spray wood to prevent or control attack. Repeat if single treatment is ineffective. Use refined oil if odor is a problem.	Shut off all pilot lights and prohibit smoking to prevent possible explosion indoors.
Subterranean termites	Aldrin	Emulsion, 4	4 gal./10 linear ft. per foot of soil depth.	Apply to soil adjacent to each side of foundation. Prevents and controls termite attack.	Prevent contamination of water wells. Avoid treating soil where there is hazard to contaminating wells or other water supply systems.
	Chlordane	Emulsion, 8			
	Dieldrin	Emulsion, 4	1 gal./10 sq. ft. of soil surface.	Overall treatment of soil surface before pouring concrete slabs. A preventive treatment.	
	Heptachlor	Emulsion, 4			
Nonsubterranean termites	Hydrogen cyanide	F	2 lb./1,000 cu. ft. at temperature above 65° F. for 48 hours.	Fumigation.	Methyl bromide and hydrocyanic acid are extremely deadly and must be used only by licensed operators. Do not re-enter a fumigated building until it has been aired for at least 48 hours.
	Methyl bromide	F	3 lb./1,000 cu. ft. at temperature above 60° F. for 24 hours.		

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